DOCUMENT RESUME

ED 364 912 CS 214 153

AUTHOR Leino, Anna-Liisa; Drakenberg, Margareth
TITLE Metaphor: An Educational Perspective. Research Bulletin 84.
INSTITUTION Helsinki Univ. (Finland). Dept. of Education.
REPORT NO ISBN-951-45-6427-8; ISSN-0359-5749
PUB DATE 93
NOTE 79p.
AVAILABLE FROM Department of Education, P.O. Box 39 (Bulevardi 18), SF-00014, University of Helsinki, Finland.
PUB TYPE Viewpoints (Opinion/Position Papers, Essays, etc.) (120) -- Information Analyses (070)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Cultural Context; *Definitions; *Educational Theories; Elementary Secondary Education; Foreign Countries; Higher Education; *Language Role; *Metaphors; Research Needs
IDENTIFIERS Discourse Communities; *Finland; School Culture; *Sweden

ABSTRACT

Noting that metaphor has become a multidisciplinary concern, this monograph examines the concept of metaphor in an educational perspective and describes and analyzes how certain specific metaphors are used in education. To define the concept, the monograph studies different theories of metaphor and previous definitions. To study how metaphor is used in education, the monograph discusses certain metaphors which are frequently encountered--among them, root metaphors such as education as guidance, education as growth, and education as liberation. The monograph emphasizes the use of metaphor in Finland and Sweden, where educational researchers have shown very little interest in metaphor. The monograph also outlines ideas for further studies. A figure illustrating the relationship between metaphor, analogy, and simile is included. (Contains 159 references.) (Author/RS)

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RESEARCH BULLETIN 84

Anna-Liisa Leino Margareth Drakenberg

METAPHOR: AN EDUCATIONAL PERSPECTIVE

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Anna-Liisa Leino Margareth Drakenberg

METAPHOR: AN EDUCATIONAL PERSPECTIVE

Helsinki 1993

ISBN 951-45-6427-8
ISSN 0359-5749
Helsinki 1993
Yliopistopaino

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University of Helsinki
Department of Education
Research Bulletin No. 84, 1993

Metaphor: An Educational Perspective (70 pages)
by Anna-Liisa Leino and Margareth Drakenberg

Abstract
Metaphor, which has traditionally been the concern of the arts and humanities, has recently become a multidisciplinary concern. What has caught our attention as educational researchers are our frequent encounters with the concept, not only in contexts referring to vivid teaching strategies to enhance learning, but also in the context of educational science and research. Our purpose was to study the concept of metaphor in an educational perspective and to describe and analyse how certain specific metaphors are used in education. Our data was relevant literature in the field. In order to define the concept our approach was deductive: we studied different theories of metaphor and previous definitions. In order to study how metaphor is used in education our approach was inductive: on the basis of the data we had gathered we discussed certain metaphors which we frequently encountered. In this analysis the emphasis was on their use in Finland and Sweden, where educational researchers have, at least so far, shown very little interest in metaphor. Ideas for further studies were also outlined in the paper.

Key words: learning style, knowledge, image, theory, model

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Acknowledgements

Little did we know about the complications of our theme when we first started this study. Gradually, however, we became aware of them. Friends and colleagues in the faculty have helped us in many ways. We are grateful for the feedback and constructive criticism we have received from Paul Hellgren, Kari Nurmi, and Jarkko Leino. We have always had an opportunity to discuss our theme with Erkki A. Niskanen, which we appreciate very much. We also want to extend our gratitude to Sirkka Kekki and Tuula Ruhanen, who helped us find relevant literature. The services of the University Language Revision Center are also gratefully acknowledged.

Anna-Liisa Leino

Margareth Drakenberg

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"Metaphor has been treated as a sort of happy extra trick with words, an opportunity to exploit the accidents of their versatility, something in place occasionally but requiring unusual skill and caution"
I.A.Richards.1936:The Philosophy of Rhetoric.

1. Introduction and Purpose of the Study

Figurative language, of which metaphor is a prime example, has traditionally been the concern of the arts and humanities. Recently, however, metaphor seems to have caught up the interest of scholars of diverse traditions and backgrounds. The concept of metaphor itself, as well as the distinction between literal and figurative language, have become a multidisciplinary concern. Literal language has been the language of science with its empirical and rational modes of inquiry, and figurative language that of the arts and humanities. The interdisciplinary nature and its unprecedented importance in modern thought has moved metaphor from a place on the ornamental fringes of discourse to the core of educational questions: the mind´s endless attempt to make sense of reality.

What has caught our attention as educational researchers are our frequent encounters with the concept of metaphor in educational literature, not only in contexts referring to vivid teaching strategies to enhance learning but also in the context of educational science and research. The appearance of metaphor on the educational scene seems to have been simultaneous with "the paradigm shift" from positivistic research orientations to more phenomenological ones, with the so-called narrative methods also gaining ground. The famous book entitled METAPHORS WE LIVE BY written by George Lakoff and Mark Johnson (1980) may also have contributed to the general interest in metaphor. The authors show how metaphors are part of our everyday speech, how they pervade not only

language but also thought and action, and how essential they are to human understanding. In fact, metaphor is a process by which we view the world and the heart of how we think and learn. A revealing example of the power of metaphors was Lakoff´s article, which circulated in electronic mail at the time of the Gulf crisis and discussed the metaphors in terms of which Americans talked and thought about the war. The importance of metaphors is also expressed in Sperber´s law (Kearns 1987, 23) according to which "an era´s dominant concerns are reflected in its metaphors, the concerns becoming, in Sperber´s words 'centers of metaphoric attraction'".

In spite of the wide-spread agreement about the influence of metaphors on our lives and actions, there is very little research on the importance of this powerful factor in the field of education. We consider this kind of research very important because metaphors seem to be hidden factors, like "hidden curriculum" (a metaphor itself), which should at least be revealed so that we as educators are aware of them and perhaps try to change them if necessary. The interest in metaphors in the international educational arena seems to be fairly recent, judging by the articles appearing in different journals. A pioneering work is METAPHORS OF EDUCATION, a book of essays about the use of metaphor in talk and writing about education originally based on a series of lectures delivered by William Taylor and his co-workers at the University of London Institute of Education (Taylor 1984). In Finland J. Leino (1987,6) has given a brief description of metaphor mainly in terms of metaphorical truth but a review of the literature reveals that not many educators in the Scandinavian countries are aware of metaphors and their importance for our thinking, learning, and acting. More interest has been shown in metaphor in other fields (see e.g. Harvilahti et al. 1992; Sköldberg 1990; Jeffmar 1992).

A preliminary starting point for our study was offered by the field of learning style. Although the quality of the numerous systems developed for measuring leaarning styles varies greatly, one with a solid theoretical background and supporting empirical evidence is KNOWLEDGE ACCESSING MODES INVENTORY (Rancourt 1986), which measures the following three modes or styles (for terminology see Leino et al. 1989): the empirical, the rational and the metaphorical or noetic, as it later came to be called. The theoretical background of this instrument originates in Royce and Powell´s (1983) theory of personality, in which the style system (together with the value system) has a central position. The style system consists of the three aforementioned styles, called in this theory psychoepistemic styles.

Considering the scope of the theory and its large number of components, it is no wonder that the concept of metaphor has remained rather vague and unspecified. One almost has the impression that it is basically considered to be unproblematic.

Taking into account the recent developments in literary theory and the implications metaphor may have for education, we decided to investigate more closely the concept of metaphor itself as well as its relevance and use in different fields of education. However, we will not be dealing with other specific types of figurative language, or tropes, since metaphor can, after all, be regarded as a kind of "umbrella" term (Johnson—Laird 1983) for many other rhetorical devices that exist. Sadock (1979/88, 46), for instance, names the following: metonymy, synecdoche, hyperbole, understatement, irony, and euphemism, while Cohen (1979/1988,64) includes irony, litotes, allegory, simile, and metaphor among the figures of speech. We will return to some of these terms in chapter 3. Several researchers have attempted to make a distinction between metaphor and other kinds of figurative language (e.g. Way 1991). The lack of success of such efforts may be due to the fact that distinctions between different kinds of figurative language are vague in themselves. Metaphor is a notoriously difficult case in point, which is very obvious when it comes to defining the concept.

Thus the main purpose of the study can be expressed in the form of the following general question: What is metaphor in the field of education? Answering the question presupposes a survey of relevant literature in the area on the basis of the following considerations. Since metaphor has for centuries been largely the 'property' of literature and literary criticism, it is only natural that a survey of the area may prove interesting and fruitful for education. Since the dominant psychological theories of the mind are, for instance, reflected in the works of writers, as e.g. Kearns (1987) has shown, it is possible that a literary a metaphor exerts an influence on the work of a scientist who is developing his theories. At this stage, however, it is not possible to further investigate this possibility, considering that we are here concerned with only a small-scale overview. Metaphors have also been dealt with in philosophical literature. However, we will exclude the philosophical texts which categorize metaphor as a type of knowledge only to be dealt with in terms of its truth value. The fruitlessness of this approach has been proved by Way (1991) and others. Our main sources of information will be educational and psychological literature including cognitive science. Metaphor has long been treated

almost exclusively as a stylistic phenomenon. This linguistic approach to metaphor has, however, been rather narrow and very little - if any - attention has been given to it as an educational concept. We will not omit linguistic aspects, but will, however, out of necessity, concentrate mainly on the literature which seems of direct relevance to the field of education, even from the point of view of defining metaphor. As Soskice (1985, 15) has pointed out, a definition of metaphor useful to one discipline may prove quite inadequate for another. In our attempt to define metaphor as a concept in education our approach will be deductive, i.e. our starting point will be a presentation of some theories of metaphor. The choice of these theories will be specified in chapter 2.

Our second purpose can also be expressed in the form of another general question: How are specific metaphors used in education? Answering this question presupposes also studies of relevant literature. We are particularly interested in "powerful" metaphors, i.e. those accepted and widely used by educational researchers and practitioners. We assume that these metaphors have influenced one or more areas of educational theory, research or practice. We will describe and analyse some specific examples of metaphors that we have come across during this our research processs. There will be no attempt to give an exhaustive answer to our overall question. Consequently, our plan is not to gather a representative sample of metaphors appearing in different educational contexts but rather to deal only briefly with some frequently encountered examples. Here our approach will be inductive, i.e. we will study some metaphors tracing their general background and considering their conceptual framework.

At this initial stage we also hope to establish some general guidelines for further studies. Later on these guidelines will concern us in greater detail.

In our search for literature ERIC and national educational databases will be complemented by manual search in the university libraries in Finland and Sweden. The latter is very important particularly from the point-of-view of finding older literature in the field.

In the following we will present different theories of metaphor and then deal with the question of how to define the concept. These two topics, i.e. theories and definitions of metaphor, are quite complicated and so closely interwoven that dealing with one would almost necessitate dealing with the other simultaneously. This is not, however, possible in our case because education is a field which has not developed its own theories of

metaphor or made any serious attempt to define the term. We therefore have to carry out a systematic study of existing theories and existing definitions separately in order to develop such an overview of the situation that is sufficient for our purposes. Because of these complexities we want alerady to make the following specifications: the word **metaphor** is derived from Greek 'metaphora' meaning 'transfer' or 'carry over' (Hawkins and Allen 1991). It is often, at least implicitly, considered to consist of two parts, originally called the '**tenor**' and the '**vehicle**' (Richards (1936). Tenor is nowadays often called 'topic' ('subject term' and 'principal subject' are also used) and it refers to that of which something is being stated. Vehicle is the term or terms used metaphorically ('metaphoric term' and 'referent' are also used). The common characteristics of the two are called the '**ground**', and the dissimilarity between the two terms being compared is called '**tension**' (Richards 1936). These terms coined by Richards in the thirties are still in use. In order to illustrate this terminology we use one of the many examples given by Hunt (1987,78). In "thinking of teaching as being like a harbor master", 'teaching' would be the tenor, 'harbor master' the vehicle, 'what those two share in their work' the ground, and 'the dissimilarities' the tension. We will in the following use a slightly altered version of this metaphor "teacher is a harbor master" to demonstrate the characteristics of different theories of metaphor.

2. Theories of Metaphor

Metaphor has intrigued scholars and researchers ever since ancient times when Aristotle introduced his substitution view of metaphor. A great many theories have since been presented to describe and explain metaphor and there are many ways to characterize and categorize these theories. In 1962 Black presented two different theories or views of metaphor: the substitution view and the interaction view. Searle (1979/88), before sketching his own theory of understanding metaphor, divided the existing theories into two main groups: the comparison theories and the interaction theories. Comparison theories assert that metaphorical utterances involve a comparison or similarity between two or more objects, while interaction theories claim that metaphor involves a verbal opposition (Beardsley) or interaction (Black) between two semantic contents.

There are also other categorizations. Based on the various theories of metaphor discussed in philosophical literature, Soskice (1985) presented

the following groups: substitution theories, emotive theories, and incremental theories, the latter consisting of Beardsley's controversion theory, Black's interactive theory and her own interanimation theory. Tourangeau and Sternberg (1982) have, on the other hand, divided the theories into the following three groups: those involving comparison, anomaly, and interaction; while Gibbs (1987), who is concerned with the problem of specifying the meanings of metaphor, proposed a categorization into Black's, Davidson's and Searle's theories. One of the most comprehensive categorizations is the latest, presented by Way (1991). Her purpose is to find the theory which best explains the data accumulated through psychological experiments on understanding nonliteral speech. This is obviously the reason for the comprehensiveness of her categorization, which consists of the following: emotive theories, substitution theories (comparison, analogy and controversion), anomaly theories, and interactive theories.

In the following we will mainly resort to the more traditional categorrization, presented by Black, into two groups: substitution theories and interaction theories. There are differences between these two groups concerning the question of the cognitive content of metaphor. The substitution theories hold that the content of metaphor can be entirely replaced by some literal expression. Accordingly theories like these metaphors are solely ornamental in function. Interaction theories, on the other hand, see metaphors as irreducible to literal meaning and consider it then a result of the interaction of two concepts or domains. According to the categorization we are going to use, substitution theories include the following: substitution theory, comparison theory, and tension theories (emotive theory, tension theory, and anomaly theory). All these theories have the following two characteristics in common: they see metaphor as a deviant use of language and they do not consider the relationship between tenor and vehicle to go beyond the level of words, sentence, or paragraph. The basic assumption is that any metaphor can be replaced by a literal paraphrase without a loss of any of its meaning. In the second main group, interaction theories, we have listed the following theories: Black's theory, domains-interaction theory and dynamic type hierarchy theory. It is characteristic of these theories that they consider metaphor to go beyond the level of words to a shared body of knowledge and assumptions that are associated with the words. Metaphor thus involves the interaction of these two domains. Theories belonging to this group relate the tenor to the vehicle so as to produce a meaning that is new and transcends both parts of the metaphor. In addition to these two main categories of theories we

will also present Davidson's theory as a category of its own for reasons to be specified later on.

The theories presented in this paper are neither entirely different form each other nor entirely static. They have each developed over a period of time and it is typical of the whole field of metaphor that even at a given time no two theorists supporting the same general position necessarily agree on every detail. The different views have often been drawn from some elements in an earlier view, and sometimes only minor dissimilarities distinguish them from one another.

Theories of metaphor have been thoroughly discussed by many eminent researchers. This paper will not present every version of the different theories but rather present a shortened version of each theory that captures what we see as the central characteristics of the position in question. As for the terminology appearing in the literature we have seen, it seems that many writers have used the two terms 'theory' and 'view' interchangeably as synonyms. We will use 'theory', but may occasionally resort to 'view' in order to avoid unnecessary repetition.

2.1 Substitution Theories

Although philosophers have been interested in the nature of metaphor ever since the time of Aristotle, most researchers today agree that relatively little progress was made until the present century. A prime reason for this might be the relative imprecision and inadequacy of the dominant philosophical theories, which will be clearly demonstrated by a review of some of the most distinguished ones. Earlier researchers have traditionally ignored, for instance, the pragmatic and communicative aspects of language. New trends in linguistics and language philosophy have contributed to the development of such fairly new fields as sociolinguistics and psycholinguistics, of which the latter, in particular, has recently shown an increasing interest in metaphor.

2.1.1 Substitution Theory

The oldest of the theories of metaphor is undoubtedly the substitution theory. It is usually accredited to Aristotle and Quintilian, although "the basic Substitution theory is in all probability a 'nobody's theory' of meta-

phorical meaning" (Soskice 1985, 26). This theory claims that metaphor is another way, a decorative way, of saying what could be said literally. In Soskice's words (1985,24) it has "the virtue of clothing tired literal expressions in attractive new garb". This means basically that an improper or deviant word replaces or substitutes the proper one. Our example "teaching is a harbor master" cannot mean what it says directly , because it is anomalous from the view point of normative logic. The metaphoric sentence says something else than what it "really" says. According to this view an intruding term (harbor master) is thought to substitute the literal term (here we can think of organizer, supervisor, or protector) that constitutes the underlying intent. Consequently, to comprhend this underlying intent the listener/reader has to replace the intruder by a literal term or concept compatible with the rest of the sentence. Supporters of this view offer mainly two kind of reasons for using metaphors; they are useful when no literal terms are available, and they are useful for ornamental purposes. Metaphor can thus be regarded as a kind of riddle or puzzle, which generates tension while the hearer/reader tries to explain it by means of a literal interpretation. Because a literal substitute of metaphor is readily available the value of metaphor for scientific purposes has been insignificant. Aristotle, who considered metaphors to be implicit comparisons based on the principles of analogy, believed the command of metaphor to be a sign of the genius and therefore not of common use (Ortony et al. 1978a,921). Metaphor has remained a stylistic device to be used only for ornamental purposes, which is why this theory has been called "the ornamental theory" (Soskice 1985,24). It seems that Soskice has grossly oversimplified the situation. Aristotle mentions specifically and explicitly the importance of metaphor as a teaching device (RHETORIC, III. IX. 9-x. 2). The substitution view or one or another of its variations to be presented in the following has been the prevailing one until quite recently.

2.1.2 Comparison Theory

The comparison theory is, according to Way (1991), a slightly more sophisticated version of the substitution theory, while Black (1962,35) considers the comparison theory a "special form" of the substitution theory, because "it holds that the metaphorical statement might be replaced by an equivalent literal comparison". However, the comparison theory regards metaphor as a shortened form of literal comparison, a form of ellipsis. According to Levin (1979/88,128), this view implies that

"something is compared to some other thing in respect of that other thing's properties or characteristics". According to this view the topic and vehicle are similar in some respects, in spite of their manifest differences. In interpreting the metaphor "teacher is a harbor master" the listener/reader is concerned with comparing two things for similarity, rather than just substituting one term for another, although the metaphor is still regarded as essentially ornamental. In the metaphor "teacher is a harbor master" an interpretation according to the comparison view implies that the topic (teacher) and the vehicle (harbor mater) are similar in some respects, in spite of the manifest differences. To understand this metaphor the reader/listener must replace what is anomalous metaphor with an assertion of similarity. Thus, the sentence can be interpreted to have the following meaning: teachers are simlar to harbor masters in both having the properties of x, where x could be organization, supervision or protection. Thus according to this view the meaning of a metaphor is held to be equivalent to that of the corresponding simile. The simplest reading of the comparison view suggests that metaphors are based on similarity and that this similarity is based on shared category membership. Thus, in this view we rely on some pre-existing similarity — a similarity that is made explicit by comparing all characteristics of the tenor and the vehicle in the metaphor. More recent formulations emphasize attributes and features (Tversky 1977; Johnson and Malgady 1979) or salient attributes or features (Ortony 1979/88). Katz (1982) has demonstrated four statistically distinct indices of saliency: dominance, typicality, fluency, and imaginal distinctiveness. The authors mentioned above assume that similarity between the terms is based on resemblances rather than identities between the features of tenor and vehicle.

Comparison is thus treated as the basic process underlying the comprehension of metaphor. Nowadays G. Miller is perhaps the most articulate proponent and developer of this view. He concludes in his article "Images and models, similes and metaphors" (1979/88,248) that "the grounds for a metaphor can be formulated as relations of similitude that can be expressed as comparison statements". The centrality of the concept of similarity is thus one of the very dominant characteristics of this theory, and Miller has proposed a detailed and rigorous treatment of the various ways in which similarity statements can underlie metaphors. However, it seems reasonable to us to assume that metaphors have various purposes, which may necessitate differentiation in the effects of similarity. As similarity is such a predominant characteristic in this view of metaphor, levels of similarity have also been investigated. Malgady and

Johnson (1976) have shown that metaphors seem to suffe, when tenor and vehicle are too similar. As a result, comparison theories sometimes predict either that metaphors improve until some cut-off of similarity is reached, or that intermediate levels of similarity produce the best metaphors (Tourangeau and Sternberg 1982,208).

There are different variations of comparison theory, but they all have in common the basic idea that metaphor is a comparison in which one term (the tenor) resembles another (the vehicle), i.e. that a metaphor is simply an ornamental substitute for a literal expression. "But since the criteria for identifying metaphor are semantic, the unit in which a metaphor consists must be greater than the word. Even were metaphor the consequence of deviant word meaning we should not be able to recognize a particular meaning of the word as deviant apart from its contexts" (Soskice 1985, 21). These critical comments highlight the dissatisfaction with word as the primary unit of meaning in the substitution theories. However, as with any comparison, there is always some residual dissimilarity (tension) between the terms used in the comparison. Comparison theorists do not seem to have considered this dissimilarity to be problematic.

2.1.3 Tension Theories

We distinguish three tension theories: the emotive theory, the tension theory, and the anomaly theory. The reason for this grouping is that these three theories are, first of all, very closely interrelated and not much different from the substitution views. Furthermore, they differ from the substitution views in the same way and take dissimilarity rather than similarity to be central for the understanding of metaphor. This dissimilarity was originally called tension by Richards (1936).

Characteristic of the tension views is their focus on one genuine aspect of metaphor: its ability to cause feelings of tension, surprise, and discovery in the hearer/reader. They also consider the purpose of metaphor to be purely aesthetic, used only to please and entertain the hearer/reader. These views may well have caused the exclusion of metaphors from scientific discourse for a long time.

Emotive Theory. The different versions of emotive theory share a non-cognitivistic view of metaphor, arguing that it is an expression that has emotive import but no meaning (Beardsley 1958,135). The emotive view

also holds that a metaphor is a consequence of deviancy in word use — a consequence of the failure of literal reading. But even though metaphor according to these views is empty of any cognitive content, it can, however, gain an emotional one which stimulates the emotions of the reader/hearer. The emotive theory of metaphor is said to have many parallels to emotive theory of religious and other ethical statements (Soskice 1985). Notorious, however, is the difficulty encountered in formulating a convincing emotive theory when the deprivation of cognitive content is at stake.

Tension Theory. This view was originally introduced by Richards (1936), who emphasized that there are other relations than resemblances between tenor and vehicle and among these relations are "disparities" (p. 108). He further pointed out that "as the two things put together are more remote, the tension created is, of course, greater" (p.125). This phenomenon has been explained by means of more modern terminology as the conceptual incompatibility between the terms in metaphor, which was dictated by the role played by selection restrictions in linguistic theory (Katz 1972). The juxtaposing of deviant, anomalous or opposing referents in metaphor produces in the hearer/reader a desire to reduce the tension by resolving the anomaly. Richard's idea of the tension in a metaphorical expression represented a radically new and pioneering point-of-view. The time wasn't really ready for such ideas, but as we can see today,they became very much of a starting-point for Beardsley and the anomaly theory.

Anomaly Theory. This group of theories includes several versions of Beardsley's (1958,138) controversion theory, which he later called "the verbal-opposition theory" (see Black 1979/88). These views argue that the metaphoricalness of an expression stems from a conflict of word meaning. The exact nature of this anomaly is, however, debated among many theorists; still, it is "seen as a kind of semantic category mistake" (Way 1991, 42). It is emphasized that the dissimilarity between tenor and vehicle "creates complexity, incongruity and novelty" (Tourangeau and Sternberg 1982,211). This means that the anomaly theory assumes that metaphor always involves some form of literal falsity or violation of semantic categories and, instead of comparing a list of properties or features for two different things, we, in fact, compare relations among properties/features for similarities of proportion between the two things compared. It is typical of the analogy approach that one ends up with a kind of relative similarity. In other words, the theory is a purely

formalistic account: metaphor can be identified and understood without reference to any extralinguistic considerations. However, since the same sentence can be considered literal in one situation and metaphorical in another, much criticism has been levelled at Beardsley's more restricted account of a metaphor, and more recent versions of this approach have emphasized that the consideration of context, reference, and speaker intentions are essential in distinguishing metaphorical and literal utterances.

2.1.4 Critical Comments on Substitution Theories

Theories belonging to substitution theories can be criticized for their view of language as an abstract, static system that can be studied as such independent of its use in certain contexts, and situations. This view has old traditions in the history of linguistics. In addition to this general observation, which concerns the whole research tradition, substitution theories have received a great deal of criticism on account of their vagueness. The exact nature of comparison has been discussed, as well as the implications of the various proposed definitions. How metaphors are used and understood has equally been debated. The wide range of criticism varying from author to author is a feature characteristic of the whole discussion.

In his criticism of comparison theories Searle (1979/88, 99-101) points out how they have failed to make a clear distinction between the statements of comparison, which are considered to be part of the meaning or the truth value of the metaphorical statement, and the statements of similarity, which to him function as comprehension strategies. It seems, in fact, that the vagueness of the concept of similarity is the most extensively criticized characteristic of the comparison theory (e.g. Ortony 1975, Tourangeau and Sternberg 1981). It has been emphasized that feature comparison cannot be the only special process involved in understanding metaphors; it is also obvious that the meaning of a metaphorical expression is not completely captured by a literal paraphrase. Metaphors are generative; it is consequently "difficult to capture the entire web of associations and implications that result from a metaphor in a single literal paraphrase, or even a set of literal phrases" (Way 1991,36). Criticism has also been levelled at the idea that the ground of a metaphor consists of shared category membership or shared features. Very often in this theory the features shared are often shared only metaphorically

(Searle 1979/88; Tourangeau and Sternberg 1981). Substitution views, in particular, have been criticized for the notion that metaphors lack a cognitive content that is not provided equally by the literal term (Soskice 1985,24-25).

Substitution and comparison theories share the assumption that there are always two objects to be substituted or compared. This is not, however, necessarily true. Some metaphors involve, for example, a secondary vehicle or a hidden vehicle — a problem pointed out by Searle (1979/88) but emphasized even earlier by Richards (1936). An inadequate explanation of tension is also one of the weaknesses of these two groups of theories (Ortony 1979/88) as well as the failure to provide a new form of understanding, for instance in making the strange familiar (Petrie 1981; Tourangeau and Sternberg 1982). These theories also ignore the dynamic as well as geographical nature of language (Aspin 1984).

Tension theories have come in for criticism of theirt own. Although all the tension views have a great deal to contribute to the analysis of metaphor, for instance in their emphasis on the role of the secondary meanings or connotations of the words involved in metaphor, they also involve many problems. First of all, the same critical comments as were directed against the substitution view are appropriate here, too, because somehow the tension theorists tend to revert to a search for shared features. Furthermore, the tension views have explain how the proportional similarities are generated and how to explain why certain characteristics are considered relevant while others are not, although they are equally available. Finally there are metaphors that cannot be explained by these views, for instance metaphors which do not involve any contradiction in their wording or violate any semantic categories.

2.2 Davidson's theory.

Davidson's theory does not fit neatly into either the substitution theories or the interaction theories. Way (1991) has omitted it from her categorization and Soskice (1985) included it in the emotive theory. Davidson himself seems to consider his theory to belong to the interaction theories. It is similar to the substitution theories in claiming that what a metaphor says could also be said literally and it shares with the emotive theory the non-cognitivist view of metaphor. According to Davidson, metaphor is sig-

ficant not for what it says, but for what it does. We will present the theory here because it, together with the ensuing discussion, is a good example of the state of the art in the field.

The theory was presented in one of the lectures at the symposium, "Metaphor: The Conceptual Leap" sponsored by the University of Chicago Extension (Davidson 1978). The main message of the theory (1978,30) is that "metaphors mean what the words in their most literal interpretation mean, and nothing more". Davidson challenges the idea, shared by many distinguished researchers, that metaphor has, besides its literal sense or meaning, also another sense or meaning. He, in fact, calls this idea "a central mistake". He makes a clear distinction between what words mean and what they are used to do, concluding that metaphor belongs exclusively to the domain of use and consequently reminding us of speech acts such as hinting, lying, or promising. To him metaphor is a proper device not only in literature, but in science, philosophy, and the law. Metaphor often makes us see aspects of things we have not noticed before. Davidson criticizes the notion that something could be said about the effects a metaphor has on us. According to him "the common error is to fasten on the contents of the thoughts a metaphor provokes and to read these contents into the metaphor itself" (1978,43). The theory seems to be quite controversial and has been criticized in detail by Goodman (1978), Black (1978) and also Soskice (1985), who, on the other hand, finds the theory "attractive" as does Gibbs (1987,35). Black considers it arbitrary "to restrict a metaphor's content to what is explicitly expressed by it" (p.184). And we know by now that there are no 'standard', 'real', 'correct', or 'essential' meanings of terms, as Aspin (1984), in his discussion of metaphor and meaning, has pointed out referring to the work of the language philosophers. To think that there are such standard meanings "is to commit oneself to a search for a chimera" (p.26). But Davidson is right in claiming that there is very little that can be said on the effects a metaphor has. These can be established only through empirical research.

2.3 Interaction Theories

The Greek grammarians recognized in metaphor (meta=trans; pherein=to carry) a means by which language was both embellished and extended. However, in the substitution theories the metaphor's ornamental function has been dominant, and this view remained very powerful until Black's

article "Metaphor" was published. This article reprinted in "Models and Metaphors" (Black 1962) became a landmark and is nowadays considered to be the classical description of the interaction view of metaphor.

2.3.1 Black's Interaction Theory

This view was mainly developed as a response to the weaknesses found in the substitution theories. In his book, Black (1962) considers and rejects all the formulations of the substitution view, according to which every metaphorical statement is equivalent to a literal statement. "Metaphorical statement is not a substitute for a formal comparison or any other kind of literal statement, but has its own distinctive capacities and achievements" (Black 1962,37). The interaction view has its basis in the work of Richards (1936), who speaks of both transaction between contexts (p.94) and interaction, which is a necessary condition for a metaphor to have a meaning. The co-presence of the vehicle and tenor is not sufficient (p.100). The ideas presented by Richards remain, however, rather general and in need of further specification, which Black has done. Black shares the basic notion with Richards that metaphor has two distinct subjects and the distinctive cognitive content of the metaphor is the consequence of an interaction between the two subjects. When Black (1962) says that the two subjects interact, he means that their two systems of associated commonplaces interact in such a way as to produce a new, informative and irreplacable unit of meaning. When Black argues that the topic and vehicle have systems of associated commonplaces, he means, for example, in the metaphor "teacher as harbor master" that some implications associated with the vehicle (harbor master) are applied to the topic (teacher) in such a way as to alter the topic's system of implications. Thus, in seeing the topic as the vehicle, one experiences it as having properties that are alien to its typical identity. This is different form the substitution views, where topic and vehicle are assumed to have independent and conventional identities. In trying to explain how the interaction view works, Black introduces the filtering process. This processis is, according to Black, interactive, because the filter alters the identity of the topic. Black (1979/88, 28-29) argues that his interaction theory can be summerized in the following claims:

"1. A metaphorical statement has two distinct subjects, to be identified as the 'primary' subject and the 'secondary' one.
2. The secondary subject is to be regarded as a system rather than an individual term.
3. The metaphorical utterance works by 'projecting upon' the primary subject a set of

'associated implications' comprised in the implicative complex, that are predictable of the secondary subject.
4. The maker of a metaphorical statement selects, emphasizes, and organizes features of the primary subject by applying to it statements isomorphic with the members of the secondary subject's implicative complex.
5. In a complex of particular metaphorical statement, the two subjects 'interact' in the following ways: a) the presence of the primary subject incites the hearer to select some of the secondary subject's properties; b) invites him to construct a parallel implication-complex that can fit the primary subject; and c) reciprocally induces parallel changes in the secondary subject".

As can be seen, the interaction view differs markedly from the preceding views presented in this paper, as it emphasizes both similarity and dissimilarity of the topic and vehicle as a means to highlight analogous or parallel attributes rather than those literally shared. What Black´s theory makes explicit is that metaphor does not depend on the factual accuracy of these commonplaces, but simply on the fact that roughly the same set of associations are made by speaker and hearer. Good metaphors, according to this view, relate the topic and the vehicle to produce a meaning that is new and transcends both. Thus, in the interaction view metaphors involve whole systems of concepts, not just the terms of the tenor and the vehicle. Black (1962) emphasized that both substitution and comparison metaphors could easily be changed to literal expressions, while interaction metaphors could not because they require the reader "to make inferences and to draw implications rather than merely to react" (Ortony et al. 1978a, 923). Thus, the interaction view presents an interesting picture of the power and usefulness of metaphor.

The interaction theory approaches metaphor functionally rather than grammatically and gives metaphor a role which is of pedagogical value. It permits the formulation and recognition of new relationships and has the capacity of relating new knowledge to old. Petrie (1981) argues that metaphors have a comparison level as well as an interactive level. He further suggests that it is the interactive level of the metaphor that creates similarities and thereby has the capacity to build bridges between a student's earlier conceptual and representational schemas and the later schemas of the strange or unfamiliar content to be learned. Metaphors, according to this view, may also permit communication of things that cannot be literally expressed as well as provide the possibility of communicating a more holistic and vivid impression of the phenomenon (Ortony 1975).

2.3.2 Domains-Interaction Theory

One of the most recent theories is the "domains-interaction" theory developed by Tourangeau and Sternberg (1981 and 1982), which draws on earlier theories of metaphor but borrows in particular from interaction theory. The basic idea is that metaphor correlates two systems of concepts from different domains. Metaphor consequently involves not only two particular things but also the domains to which they belong. The researchers assume that concepts — and the features characterizing them — cluster into the domains. They distinguish two forms of similarity: within-domain similarity and between-domain similarity. The former applies in one particular domain and determines the position of the concept in relation to the other concepts within that domain. It indicates the degree to which terms occupy similar positions relative to other members of their domain. The latter applies in the two domains indicating their similarity. The researchers have clarified these two similarities using a geometric model that illustrates the relationship between them in a concrete way (see Tourangeau and Sternberg 1981, 32).

The domains-interaction theory represents definite progress in the field of metaphor. Interaction theorists considered similarity and difference to be equally important, while the domains-interaction view presupposes that tenor and vehicle are drawn from different domains, where they occupy similar "relative" positions (Tourangeau and Sternberg 1981, 28). The concept of domain, which the researchers consider flexible, is important in this theory. The domain of a term can be its natural category or some other category to which it belongs. Domains have two functions in the theory. They, first of all, help determine the characteristics that are important for interpreting the metaphor and, secondly, they clarify the nature of the parallel that is constructed between tenor and vehicle (Tourangeau and Sternberg 1982, 215-216). Only knowledge regarding the two domains in question can prevent us from applying irrelevant and inappropriate features in the construction and the interpretation of metaphors.

The notion of domain is also interesting from a pedagogical point of view. It would seem that the domain, from which a vehicle is drawn to describe some phenomenon in education, would somehow have to be structured to yield powerful metaphors. This is particularly the case if we think of educational research, which often involves phenomena (domains) that are vague and difficult to define. Correlating concepts from such domains with

concepts from other equally fuzzy domains is not likely to lead to progress in educational research. This is also the reason why we cannot see any immediate progress in developing evaluation methods in education by means of metaphors taken from domains that are rather vague (see Smith 1981).

2.3.3 Interanimation Theory

The most prominent representative of the interanimation theory is Soskice, who discusses the conditions for a theory of metaphor that is acceptable for her purposes in "METAPHOR AND RELIGIOUS LANGUAGE" (1985). Such a theory should regard metaphor as fully cognitive and explain how metaphor gives us "two ideas for one" without resorting to the idea of substitution or comparison. In addition to these basics, it should discuss the speaker's intentions in using metaphor, the hearer's reception of it, as well as give consideration to the context in which it is said, the beliefs the speaker and hearer share, and the interpreting strategies the hearer employs. In short, it should involve such wide socio- and psycholinguistic perspectives that developing such a theory of metaphor is not possible in any foreseeable future.

Interanimation theory is a further development of Richards' (1936), from which the name of the theory has been also drawn. Soskice holds that although Richards' discussion is defective and insufficient concerning terminology and consistency, he still gives the most satisfactory account of metaphor. Consequently Soskice's interanimation theory is heavily based on Richards, whose intent was to emphasize that metaphor is an intercourse of thoughts, as opposed to a mere shifting of words or a substitution of terms. It is by realizing that a metaphor has only one subject (as opposed to Black's description of metaphor), which tenor and vehicle conjointly depict and illuminate, that an interanimation theory is possible. To Richards it was "the consequence of the interanimation of words in the complete utterance" (Soskice 1985,45) that formed the basis of metaphor. And according to this theoretical view it is thoughts and not words which are active together, and it is the unique product of the whole which makes for the excellence of the metaphor.

What seems to have caught Soskice's attention especially is Richards' subtle point that tenor and vehicle are not necessarily two terms of the utterance. This idea seems to us to suit the religious world and language

perfectly, since religious understanding often consists of metaphors or metaphorical concepts. Using the ideas offered by Richards makes it possible to avoid the criticism of using one metaphor to explain another.

Soskice argues quite emphatically that metaphor cannot be understood as a conflict of word meaning (as suggested by Beardsley). Neither can she accept Black's proposal for an interaction of two subjects. Still, she retains aspects from both points of view, i.e. metaphor is seen as a linguistic phenomenon having twin elements of tenor and vehicle. What is new and different in this theory is Soskice's understanding of metaphor as a phenomenon consisting of two levels. These two levels are not to be confused with the two stages of interpreting metaphor suggested in certain views of metaphor.

Each metaphor in Soskice´ s view involves at least two different networks of associations, however this is not sufficient to explain broader sets of metaphor or metaphorical construals. A secondary level is introduced, which "is characterized by its reliance on an underlying model, or models" (Soskice 1985,50). A close relationship between model and metaphor is suggested. "When we use a model, we regard one thing or state of affairs in terms of another, and when we use a metaphor we speak of one thing or state of affairs in language suggestive of another" (Soskice 1985,50-51). Whether this is to be interpreted to mean that model is not a linguistic or verbal phenomenon, while a metaphor is, has remained unclear to us. It is obvious that the concept of model is necessary for the theory which has been developed with religious texts in mind. Since the question of the relationships of these two key concepts is, however, also of a wider interest, further specification would have been necessary. Soskice´s statement "a lively metaphor suggests models" (p. 51) raises almost automatically the question of what "a lively" metaphor is to her. We could equally well reflect on the less "lively" metaphor´s capacity to suggest models. The concept of model can of course be accepted as a way out of the complexities of the topic.

2.3.4 Dynamic Type Hierarchy

The starting point for Way's view of metaphor as a dynamic type hierarchy (DTH) is that any theory, on the whole, has to make sense of the results received from empirical studies. In her close review of the theories of metaphor she concludes that no theory has yet satisfactorily

explained the accumulated data reported in the literature. "All the various philosophical theories of metaphor that we have seen have difficulties explaining the empirical results we have just examined" (Way 1991,59). As a consequence in her presentation she emphasizes the drawbacks of each theory and stresses how they are avoided in her DTH theory. However, her review of the theories convinces her that the interaction view of metaphor is the most promising one in spite of the severe criticism of vagueness by various experts.

According to the DTH theory, metaphor "is an intrinsic part of language, not secondary to literal processing, and its comprehension is dependent upon the context in which it is uttered as well as the content of the mental models of the hearer" (Way 1991,124). According to Way, the DTH-theory makes the most sense of accumulated research results on metaphor. It develops by generating the hierarchy of one domain and its associated conceptual graph, and redescribes it in terms of the other domain. Metaphorical language, thus, must have the same status as literal language. They are only different aspects of the same hierarchy. By viewing metaphor as a hierarchial phenomenon, Way clearly demonstrates the the potentially irreducible nature of metaphor, because the metaphor brings out higher and more abstract connections between the concepts in question. Characteristic of this view is also its close relationship to language theory, and it consequently belongs to the scientific domains of artificial intelligence and knowledge representation.

As both Way's dynamic type hierarchy theory and Soskice's interanimation theory mainly address domains of less interest for us, the former being closely concerned with artificial intelligence and the latter with theology, we as educators have decided not to discuss them in any greater detail.

2.3.5 Critical Comments on Interaction Theories

Although Black's view of metaphor has found favor in many quarters, it has also attracted a lot of criticism. One of the more persistent criticisms is it's overall vagueness. This might be due to the fact that the interaction theorists are mainly philosophers and literary critics or, as Way (1991, 51) emphasizes, Black at the time being, did not have "certain theoretical and technical knowledge available which could have provided a better 'dictionary' for discussing cognitive mechanism". This knowledge is

nowadays available and is to be found in artificial intelligence and cognitive science, according to Way (1991).

Another serious criticism is levelled towards Black's terminology, where for instance the notion of 'interaction' is metaphorical in itself and as such useless as an explanation of metaphor. Black´s idea of ´filtering´, which he uses in explaining how metaphor works, has also attracted a great deal of attention. At this point critics argue that Black has not, in fact, specified how the filtering works. A filter, at best, only reveals aspects of what is already there, which is inconsistent with the idea of interaction and production of a new, informative meaning.

Additional critical comments have been given by Searle (1979/88; see also Morgan 1979/88). He emphasizes that the interaction theory fails to make a dictinction between sentence and word meaning, on one hand, and speaker or utterance meaning, on the other. According to him, the former is never metaphorical, while the latter can be. This distinction is important not only for the study of metaphor but for other fields of language study as well. The failure of the interaction theory to make this distinction is serious for Searle, while others (e.g. Levin 1979/88) find this failure of less importance. However, as the interaction view was developed in response to the weaknesses of the other existing theories, there have been no clear statements of its explicit advantages.

In his article "More about metaphor"(1979/88), Black answered the criticism and explained the shortcomings of his earlier presentation of the interaction view. There was, however, one basic weakness in his "defense": he repeated his idea that each metaphor has two distinct subjects. This insistence is responsible for the inconsistencies of his theory. He does not explain exactly what he means by "subject" and does not expand his notion of metaphor to consider more than one kind of metaphor (A is B). Black's theory seems to us a slightly altered version of substitution theory, and its interesting and exciting interactiveness seems somehow to be lost.

2.4 Summary

Metaphor is a theme that always seems to have "haunted" reseachers. The above presentation of different theories of metaphor does not make it possible for us to claim that a generally accepted theory exists — or has ever existed for that matter. The older theories are more general by

nature, while the more recent ones represent new disciplines and also a higher degree of specialization. This is quite natural considering the general tendency of the sciences (e.g. humanistic, natural, educational) to proceed towards greater specialization. The theories of present-day researchers also differ markedly from one another, which is quite natural since they represent different purposes and different research methodologies. Soskice, for instance represents theology, which makes it easy to understand why her theory is so different from that of Tourangeau and Sternberg, who represent cognitive psychology, and that of Way, who seems to be mainly concerned with artificial intelligence. Assessing the importance of these newer theories is not yet possible, but it seems that Tourangeau and Sternberg represent a view that may prove fruitful for empirical educational research, since they have made a serious attempt to give structure to something that is basically very complex.

3. Definitions of Metaphor

The foregoing already clearly indicated the difficulties to be encountered in defining metaphor. It is not only the representatives of such "traditional" fields as philosophy, psychology, and literary criticism who take an interest in it but also representatives of more recent fields such as cognitive science, artificial intelligence, and the noetic or "frontier" (Rubik 1991,26) sciences. The task is made even more difficult when one thinks of the historical dimension of the concept, which is to be seen in the increase of bibliographies of earlier discussions of metaphor (e.g. Booth 1978). Soskice (1985,15) refers, by means of a secondary source, to a scholar who claims to have found 125 definitions and indicates that only a small fraction has been put forward. Booth (1978) quite correctly points out that since metaphor has been defined in so many ways it runs the risk of becoming meaningless since soon every expression will be a metaphor by somebody´s definition. Writers using the term in educational literature define it very seldom. This was, for instance, the case with the majority of contributors to the special issue of THEORY INTO PRACTICE (Vol. 29,1990) entitled "Metaphors We Learn By".

At the risk of replowing old ground, In Table 1 we have provided a brief overview of definitions and descriptions given in recent publications by representatives of different fields. The definitions are presented in alphabetical order according to author. Of the definitions given in various dictionaries, we have chosen only the latest (Hawkins and Allen 1991), because we do not, in fact, aim at giving a historical account of the development of the concept but are more interested in its utility in present-day educational settings. What we want to emphasize at this point is that we do not aim at an exhaustive presentation but will only give some (perhaps typical) examples of the way the concept has been defined. Later on we will make an attempt to define the concept in a way suited for our purposes.

Where we have not had the original source available to us, we have acknowledged the autor/authors of the articles where we have found the actual definitions. This does not, however, mean that the actual author de facto shares the opinion expressed in the definition.

Table 1. Examples of Definitions

1. "Metaphors are simply words used normally in unusual surroundings, or vice versa, without any expectation that particular employment of the term will become common" (Aspin 1984,28)

2. " A metaphor is an affair between a predicate with a past and an object that yields while protesting" (Aspin 1984,35)

3. "I propose that whenever an attribution is indirectly self-contradictory , and the modifier has connotations that could be attributed to the subject, the attribution is a metaphorical attribution, or metaphor" (Beardsley 1958,141)

4 ."The metaphor works by applying to the principal subject (the tenor) a system of 'associated implications' characteristic of the subsidiary subject (the vehicle)" (Black 1962,44)

5. "In the narrowest sense,metaphor can be understood as an illustrative device whereby a term from one level or frame of reference is used within a different level or frame" (Brown 1977,78)

6. "In a novel metaphor, one thing is said to be another different kind of thing to which it bears an actual resemblance. The fact that the topic and vehicle referents are different in kind is critical; without this fact there is no metaphor" (Dent and Rosenberg 1990,984)

7. "An instance of the non-literal use of language in which the intended propositional content must be defined by the construction of an analogy" (Fraser 1979/1988,176)

8. "A metaphor establishes isomorfic structures between its primary and secondary parts according to the view of philosopher Max Black" (Gowin 1981,181)

9. "The application of a name or descriptive term or phrase to an object or action to which it is imaginatively but not literally applicable" and " an instance of this" (Hawkins and Allen 1991)

10. "Technically metaphors are anomalies since they violate the rules for putting word meanings together" (Hoffman 1983, 43)

11. "A metaphor can be considered as a juxtaposition of two concepts that, when the latter are related to one another, lead to a novel interpretation of one of these concepts (Katz 1982, 283)

12. "....metaphor represents a fundamental vehicle of human thought". "...metaphors represent a fundamental way that human beings have evolved to express and organize their world , especially the world that lies beyond immediate perception" (Kliebard 1982,13)

13. "The essence of metaphor is understanding and experiencing one kind of thing in terms of another" (Lakoff and Johnson 1980,5-6)

14. "A metaphor is an abbreviated simile" (Miller 1979/1988,202)

15. "The essential nature of metaphor is that it juxtaposes elements of a concrete image in order to formulate some set of more abstract relationships" (Ogden and Richards 1960,214)

16. "Metaphor is a tension-resolvable contextual anomaly, where tension resolution can be independently characterized" (Ortony et al.1978a, 940)

17. "A metaphor is that figure of speech whereby we speak about one thing in terms which are seen to be suggestive of another" (Soskice 1985,15)

18. "Metaphor is part of a linguistic code that helps to create relevance and to constrain social identities" (Taylor 1984,17)

19. "A metaphor is a comparison in which one term is asserted to bear a partial resemblance to something else" (Tourangeau and Sternberg 1982,205)

20. "A metaphor is defined by the obvious dissimilarities between tenor and vehicle" (Tourangeau and Sternberg 1982,209)

21. "In a metaphor we see one concept in terms of another by construing features or dimensions that apply within the domain of the first concept as somehow parallell to those that apply within the domain of the second concept; further tenor and vehicle are asserted to have similar values on these corresponding dimensions" (Tourangeau and Sternberg 1982,215)

22. "A metaphor takes us from the familiar to the unfamiliar and, speaking metaphorically, serves as a bridge" (Valle and von Eckartsberg in Candy 1986,91)

23. "Language is seen as having a shifting distinction of literal and metaphoric expressions relative to particular contexts. Therefore, the definition of what is metaphoric and what is not will change in different contexts and as our language itself changes over time" (Way 1991,49)

24. "A redescription of one domain in terms of the generated hierarchy and the associated conceptual graphs from another" (Way 1991,127)

The definitions or characterizations of metaphor in the above table are quite heterogeneous. Some are closely related to their background theory, while others refer to the functions and mechanisms of metaphor. Very many either explicitly or implicitly refer to transference, similarity or dissimilarity, comparison, and resemblance. As can also be seen from the definitions, some focus on certain words or phrases in a sentence; but as far as we can see, these definitions have difficulties in accounting for the metaphorical use of a whole sentence. Another problem is that the majority of the definitions make very little, if any, distinction between metaphor and other kinds of figurative language (analogies, similes etc).

Even though there are widely differing definitions of metaphor, there is

some agreement on its typical characteristics. It often, at least implicitly, consists of two parts, 'tenor' and 'vehicle' and that which the two have in common often called "ground." These terms were already defined above in the first chapter.

According to Soskice (1985) the large number of definitions found in the literature on metaphor is due to disciplinary differences. In our opinion this is an oversimplification. After reanalysis of the majority, our hypothesis is that the differences in definitions are also due differences in the theoretical approach. To us definitions of metaphor are more appropriately analysed using a "two-dimensional" (discipline and theory) categorization than a "one-dimensional" (discipline) scale. This idea will be further explicated in a later paper.

3.1 Different Types of Metaphor

The lack of agreement between different researchers on the definition of metaphor is further exacerbated by the fact that metaphor is often provided with different kinds of attributes attached to it. In the following we will first deal with those types of metaphor in which the attribute defines or describes the quality of metaphor. To deal with every possible type of metaphor encountered in the literature is clearly beyond the scope of this study. Consequently we will not, at this stage, be concerned with those referring to the field from which they were originally derived (e.g. 'computer metaphor' (Boyd 1979/88,368) or those which indicate something of the function (e.g. 'exegetical or pedagogical metaphor', Boyd 1979/88, 359). Also those with a clear connection to a certain background theory, e.g. Black's (1979/88, 27) 'interaction' metaphor, are left out of the following presentation.

The categorization of metaphors along the dimension living — dead seems to be the most frequent when we think of different types of metaphor (see Richards 1936,102; Beardsley 1958,159). A living metaphor is characterized by the fact that a duality of its meaning is perceived, i.e. the realization that facts of one sort are presented as if they belong to another (Taylor 1984, 6). A dead metaphor was once alive but is now simply an idiom, or a conventionalized form in the language (Black 1979/ 88; Fraser 1979/88). As the metaphor becomes commonplace, its initial web of implications becomes, if not entirely lost, at least difficult to recall. An

interesting point has been made by Kearns (1987,34) and Taylor (1984, 6-7), who claim that dead metaphors can easily be made living again. The types of metaphor which would seem to be closely related to the living — dead dimension are for instance 'strong' — 'weak' and 'genuine'/'fresh' — 'stored'/ institutionalized' metaphors. Black (1979/1988,27) uses the terms strong and weak. By a 'strong' metaphor he means one which is markedly emphatic and resonant (it is rich in background implications), while a 'weak' metaphor can be compared to an unfunny joke. In a 'genuine' metaphorical utterance the process of the change of meaning, whereby an expression becomes a dead metaphor, has not taken place (Searle 1979/ 88,100). A 'fresh' metaphor is one not previously encountered, one whose meaning must really be discovered, while a 'stored' or 'institutionalized' metaphor is one which everybody is familiar with. It is on its way to becoming an idiom, but is still understood figuratively (Morgan 1979/ 88,141). It seems to us that these ways of characterizing different metaphors are interdependent so that a living metaphor could also be described as strong, genuine, and fresh.

The types of metaphor which are relevant from the perspective of education are above all root metaphors, which are very deeply embedded in our culture. They influence the way we act, think and speak. Brown (1977, 125) has defined root metaphors as "those sets of assumptions, usually implicit, about what sorts of things make up the world, how they act, how they hang together and, usually by implication, how they may be known". He also calls the root metaphor "a fundamental image of the world from which models and illustrative metaphors may be derived" (p.78). We also consider 'generative' and 'theory-constitutive' metaphors important for our study. Definitions of these metaphors say something about their functions. The term generative calls our attention to the ability of these metaphors to generate new knowledge and insight by changing relationships between the things designated (Black 1979/88, 37). They can also generate broad conceptual frameworks that structure our experience (Bowers and Flinders 1990, 51) as well as different and conflicting ways of seeing (Schön 1979/88, 278). Schön in particular (p.254) emphasizes the process-nature of these metaphors, in which seeing-as and the carrying over experience from one domain of experience to another are central. These metaphors function as cognitive tools that influence our ways of understanding, thinking, and interacting with one another and with our environment. They form, in fact, an essential part of analogical thinking, which also seeks to explain the new in terms of the familiar. Bowers and Flinders (1990, 37-39) use the terms root (also called 'source-domain')

metaphor and generative metaphor almost interchangeably.

Theory-constitutive metaphors form an essential part of the linguistic aspect of a scientific theory, at least in the early stages of developing the theory. Scientists use them in order to express theoretical claims for which no adequate literal paraphrase exists yet. There is an interesting difference between these and literary metaphors: the latter belong to a specific work of a specific writer and they tend to become hackneyed or trite when a variety of writers use them, while theory-constitutive metaphors, if they are successful, become the property of the entire scientific community, and variations on them are studied by many scientists without their interactive quality being lost. These metaphors are useful because they provide a way to introduce new terminology for phenomena which are not yet fully known or understood (Boyd 1979/88, 360-364). The difference between literal and metaphorical language in science is very problematic, for instance Pylyshyn (1979/88,433-434) has challenged the examples which Boyd has used to illustrate the use of metaphor in cognitive science. Pylyshyn does not see certain aspects of cognitive science as metaphorical at all but literal.

Kearns (1987,39) explains the difference between generative and theory-constitutive metaphors by using the following metaphors: "A generative metaphor is the bridge between a hunch and a new theory, whereas a theory-constitutive metaphor is applied according to the dictates of an existing theory. A theory-constitutive metaphor is a tool for surveying a territory whose boundaries are known; a generative metaphor is a means for orienting oneself during a new exploration." It seems reasonable to us to assume that the two types of metaphor must also be considered from two different viewpoints: that of the speaker/writer and listener/reader. There is a change of perspective from one to the other, and the question arises as to what the metaphor means to the listener/hearer and it is interpreted. This depends on familiarity with the knowledge domain in question.

3.2 Related Concepts

There is a number of concepts related to metaphor. Some of them are quite closely connected with it, others obviously not so. The distinctions between these different concepts are, in some cases, anything but clear. The whole situation at least shows how researchers representing very dif-

ferent fields and theoretical backgrounds take an interest in similar kinds of phenomena from their own specific perspectives. In the following we are going to deal with the concepts of myth, analogy, simile, metonymy, synecdoche, image, model, and theory. There are, however, several other related concepts, which will be left out, since they have greater relevance for literary analysis and criticism than for our purposes.

'Myth' is an "extension" of metaphor (Beardsley 1958,135). It is, according to Vattimo (1989), rediscovered but not precisely defined. It was originally considered to be the opposite of scientific thinking. Consequently it was of narrative, imaginative in nature, appealing to emotions. Nowadays it is a form of knowledge that bridges the gap between rationalism and irrationalism (Vattimo 1989). It is interesting to note that the Greek word 'mythos' came to be defined as 'vera narratio' or 'true speech' (Vico 1961,85;1744). Lakoff and Johnson (1980) have also dealt with myths, which according to them provide ways of comprehending experience. They, in the same way as metaphors, are necessary for making sense of what goes on around us. Lakoff and Johnson also discuss the myth of objectivism and the myth of subjectivism, offering a third possibility, which is an experientialist synthesis. Even though they see similarities in the functionings of myths and metaphors, they do not, however, specify them. In the field of education Hunt (1987,49-52) speaks of myths in the sense of — so it seems to us — widely held but false notions. Bowers and Flinders (1990) see mythologies of the past as one of the sources of root metaphors.

Two concepts closely related to metaphor are 'analogy' and 'simile'. Specifying the relationships between these concepts is not a simple task. They obviously originate from comparison view of metaphor (see Black 1962, 35, also chapter 3 in this paper) which explains the transforming function of metaphor by means of analogy and similarity. According to Miller (1979/88) the two concepts can be considered in their relationship to a third very closely concept: literal comparison. In the literal comparison the ground is obvious, e.g "John's wife is like his mother". In similes the ground for the comparison is not obvious e.g. "John's wife is like an umbrella". The last of the concepts, analogy, is patterned after the arithmetic analogy of proportionality. According to Way (1991,9) analogy and metaphor both borrow from other systems; but analogy explicitly states similarities between the two, while metaphor does not. In the same way simile is considered to be an explicit comparison and metaphor an implicit one (Way 1991,10). According to Way's view analogy and simile

are both explicit comparisons but how are they related to metaphors? Miller (1979/88,220) defines simile as follows: "Simile is a comparison statement involving two unlike things. Precisely how unlike they must be before the comparison qualifies as a simile is not quite well defined". Consequently, such a definition could just as well do as a definition of analogy, at least according to Way, who seems implicitly to differentiate between the two concepts. According to Fraser (1979/88) metaphor can be considered as a type of analogy — an implicit comparison – whereas simile is an explicit one. (see Figure 1.)

Figure 1. Relationship between Metaphor, Analogy, and Simile.

Such a discussion is based on the substitution view of the relationship between metaphor and simile. Another view is emphasized by Black (1962), who has argued that there is an important distinction between simile and metaphor in that simile cannot capture the powers and impact of metaphor because metaphor involves an interaction between the referents. In practice though, the distinction between the two is not always so obvious. Using a quote from Flaubert's MADAME BOVARY Soskice emphasized that "metaphor and simile, while textually different, are functionally the same" (1985,59).

What metaphor does is to express the analogy in an indirect way by leaving out some of its components. Thus metaphor and simile are two different kinds of analogy. We find simile less interesting than metaphor, because the terms of similitude are explicit and thus require less work from the listener/reader. One could also argue that their power to elicit or generate images (see below), which is important in educational contexts, is restricted and they are therefore less challenging. It is characteristic of the terminological situation that a case has also been made for analogic

metaphors (see Brown 1977).

Two very specific types of figurative speech are metonymy, which uses one attribute or one entity as an expression of another entity or related entity ("The crown was shocked by a series of scandals") and synechdoche, in which a part is made to represent the whole or vice versa ("The tired hands brought their own tools.") (see e.g. Way 1991,10-13). Awell-known example of synechoche from the field of education is "THE ENLIGHTENED EYE" (Eisner 1991).

Another problematic concept related to metaphor is 'image'. According to the literary critic Paul Ricoeur (1978), image occurs centrally in metaphor, but the image itself is not metaphor, it only provides "figurability to the message" (142). For centuries the idea has been advanced that images are merely faint versions of perception. They were regarded by the famous behaviorist Watson (in Sheikh 1977) as "ghosts of sensations". It has also been a general tendency to think of images as involving pictures in the head. Even though most researchers today have abandoned such interpretations of this concept, considerable disagreement exists as to how the information in an image is to be understood. This is very obvious in the literature of the last twenty years which reflects growing interest in the nature of the perception-based representations. These representations are referred to either as mental images (Anderson 1990), imagery (Kosslyn 1980) or imagining (Shephard 1984). Image has often been described in visual terms with most of this research dealing with the types of mental processes performed, for example mental rotation, folding and scanning. Thus very much of the research literature on image has been concerned with the format, i.e. whether images are "analog" representations, as advocated by Shephard (1978) and Kosslyn (1980) or "proportional" representations based on the proportional code theory, as suggested by Baylor (1971), Palmer (1977) and Pylyshyn (1981). Some psychologists have tried to combine the two approaches, for instance Paivio (1971) and Anderson (1990), who differentiate between perception-based and meaning-based representations (Lundh et al. 1992).

The controversy among "schools" and within "schools" in cognitive science has penetrated all the attempts to define image. The term is even more poorly defined in educational literature. It has been used as a construct for understanding teacher's personal practical knowledge (Clandinin 1986). It often seems to be used interchangeably with metaphor. The images of organisation Morgan (1986) uses are also called metaphors.

Welker (1991) has discussed the teacher as expert metaphor; he speaks about 'the image of the expert', and 'the metaphors of teacher as executive, manager, social worker...' (1991,21). The idea of using metaphor and image interchangeably as synonyms does not seem quite acceptable to us on the basis of the theoretical discussions summarized above. It also seems to us that it is not very common in educational literature to treat these two terms as synonyms. Berliner (1990, 86), for instance, states: "This metaphor (teacher as executive) elicits images that describe important roles....". This idea of metaphor eliciting images is well-founded since there are metaphors that are clearly generative by nature. But the relationship also seems to work the other way around for some writers. In his workshops Hunt (1987) has helped teachers bring out their own personal metaphors by means of images and guided imagery, thus images have been used to elicit metaphors. In this case metaphors and images provide practitioners with a language for sharing their work. In his latest book Hunt (1992) prefers to use 'personal images' instead of metaphors, because to him the former are more representative of an "Inside-out" and the latter of an "Outside-in" approach. Over the years Hunt has given many examples of the images which the participants of his workshops have used. An additional interesting aspect to this discussion is Brown's (1977) calls iconic metaphor. According to him it "creates the object or image as a unique entity. It shows what a thing is" (p.85). Bowers and Flinders (1990) seem to regard iconic metaphor as a synonym for image (p.42). They consider iconic metaphor to be a non-analogic form of metaphor characterizing "words with a history that can be traced back to an earlier period of analogical thinking" (p.45). Iconic metaphor is not, however, restricted to words but includes such aspects as body language as well as designs of dresses, cars or buildings, for example. Bowers and Flinders are, however, mainly interested in the pedagogical use of iconic metaphors in the classroom, a topic to be discussed in greater detail in a later paper.

The relationship between metaphor and (mental) model seems also quite problematic. All of us often use models, but we seldom pause to consider the presuppositions and the implications of this usage. It is evident from the literature in the field (e.g. Johnson-Laird 1983; Gentner and Stevens 1983) that the concept is extensively used, sometimes in sweeping assertations, sometimes in strictly defined contexts. However, the intersection of various points of view leads, according to Rouse and Morris (1986), to a fairly clear set of purposes for mental models, viz. describing, explaining and predicting (based on a modification of Rasmussen's

taxonomy).

A number of different approaches have been used to identify mental models. This is due to their dynamic character and the multiplicity of their forms. Accordingly, mental models differ substantially in terms of the research domain chosen and methods used. Consequently, a plethora of issues surround the topic, some of which are of minor importance. A few issues appear repeatedly in the literature, such as the following:

> "1.Assessibility. To what extent is it possible to capture individual's mental models?
> 2. Forms of representation. What do mental models look like?
> 3. Context of representation. To what extent can mental models be general?
> 4. Nature of expertise. How do mental models of novices and experts differ?
> 5. Cue utilization. How are models affected by cues one uses, either by choice or because of availability?
> 6. Instruction. How can and should teaching affect individual's mental models?" (Rouse and Morris 1986,355).

In our attempt to clarify the relationship between model and metaphor we will first have to distinguish between mental model and model. It seems that those representing the fields of cognitive science and psychology prfer to use the term mental model rather than metaphor when speaking about the representations in the human mind, while those following the literary research traditions would use the term metaphor. This is not, however, to say that they mean "the same thing."

It is not mental models per se that are of greatest interest to us at this stage, but models as scientific research tools and their relationship with metaphor. Model as a research tool is a simplified description of a complex system to help the researcher study how such a system might operate. There are types of models that can be characterized as sets of relationships between variables. Dickmeyer (1989) has discussed metaphor, model, and theory. He sees metaphors as important first steps in understanding a complex system but regards their inherent simplification as a limitation, a feature it shares with model. Model is often derived from metaphor (see also Bowers 1980). We may first be operating under some broad metaphor and then through research move towards a model or theory. This idea is also expressed by Kliebard (1982, 13-14).

Metaphors help us move away from the immediate and sensory into the remote and abstract, which is the realm of theory. He argues further that metaphors and theories have in common the effort to organize thinking by starting an interaction between the familiar and comprehensible, on one hand, and the thing to be explained, on the other. Not all metaphors achieve the status of theory, and not all theories have their origin in metaphor. Following the path from metaphor to theory is well-nigh impossible but its is quite obvious that metaphors, particularly theory-constitutive and generative metaphors, have the power to generate new hypotheses and thus help scientists see things in a new way. Kliebard (p.16) has pointed out how A. Bellack's and his coworkers' metaphor of language as a game (originally based on Wittgenstein) suggested that there are certain "rules" being followed in the classroom and how much of their research took the form of explicating those rules.

Our stance at this stage is that model and metaphor represent developmental stages towards theory. We are well aware that scientific models can be considered as "nothing less than metaphors elaborated" (Brown 1977, 82) and that theories themselves are fundamentally metaphoric. The developmentof of implicit theories for example, by an individual teacher (see Hunt 1987) can be assumed to be influenced by metaphoric elements and also at least, to some extent, be expressed in the form of metaphors.

2.3 Defining Metaphor

As we have already seen metaphor is a complex phenomenon which defies definition. Since in the field of education we are also concerned with complex phenomena that have to do with human beings and not only, for instance, with literary texts, we would need a definition general enough for our purposes, but also specific enough so that not every expression could be considered to be a metaphor. We have not yet found any definition that would adequately suit the purposes of education as we see them. Pending the development of such a definition we have found Soskice's (1985,15) definition acceptable as a working definition because it at least fulfills the requirements of generality and specificity. To her "metaphor is that figure of speech whereby we speak about one thing in terms which are seen to be suggestive of another." She has specified her definition by pointing out that "speaking" refers to a phenomenon of language and not to the fact that metaphors would be expressed orally. She also points out that "thing" means any object or state of affairs, and not necessarily a

physical object. Her choice of "thing" seems to be influenced by Richards (1936,118; see also Beardsley 1958,159). Soskice also comments on the phrase "seen to be suggestive", which means 'seen so by a competent speaker of the language'. To her metaphors are not mental events or physical objects, nor do they take a particular syntactic form. The question of whether metaphor always involves language has been discussed, and e.g. Beck (1987,11) considers that metaphor can operate without the overt use of words. Since the usage of metaphor is a central concern to us, we will only be concerned with metaphors that are linguistic. We will consider metaphor as an umbrella concept, with simile metonymy and synecdoche as special cases.

An interesting question that we have to deal with is how to recognize a case of metaphor and how to select our examples. Judging by the examples given in Lakoff and Johnson (1980) all language is essentially metaphoric. There are claims for this observation and also against it. Goodman (1984) has written of the difficulty of finding a thoroughly literal text without fresh or frozen metaphors in it. We have to be practical, at least to the extent that if a writer calls his expression a metaphor, we have to accept it as a metaphor. The same applies to those expressions that the scientific community seems to accept as metaphors.

4. Metaphor in Education

Educational discourse is full of metaphors. However, in many cases the metaphors are so deeply embedded in the educational language and everyday classroom speech, that they are used automatically rather than consciously and it is, in many cases, determine whether such usages are metaphors. This is particularly the case with dead metaphors such as "curriculum", "levels of meaning", or "hierarchies of needs". Metaphors, when used deliberately are often intended to help us find the way from the familiar to the unfamiliar - sometimes they work as instruments of discovery and invention. A number of writers, mainly English and American — so it seems — have expressed their opinion on the theme, but we will not attempt to review them all in the following discussion. We will rather aim at illustrating the versatility of their usage in education, after which we will give some examples. In this presentation our perspective will be that of Finland and Sweden. Of course many metaphors in education are often international, but the reasons and the ways they are used vary greatly from one country to another.

Ortony (1975,51) considers the educational power of metaphor to be twofold: it elicits vivid imagery, which encourages memorability and insightful understanding, and it provides us with effective means for moving from the well-known to the less well-known. Elliot (1984,39) on the other hand considers metaphor to be of wider use in education and enumerates such functions as the following: introducing fresh perspectives, making illuminating comparisons and contrasts, picking out kinds of phenomena not yet named, emphasizing, illustrating and enlivening dull writing etc. Tom (1984) has pointed out that the major advantage of metaphor, its ability to suggest new relations among dissimilar phenomena, can at the same time be its major strength and weakness when applied to education. It can open up new perspectives, but if left unexplored, equally well confuse and obscure our thinking. Nikolaisen seems to follow the same line of thought. She emphasizes the teaching implications of metaphor but warns against its unconscious use. Being deeply embedded in language the use of metaphor might inhibit flexible thinking in the students. "We may unconsciously be instrumental in confining their thoughts to well-known paths" (Nikolajsen 1991,319). She gives also another word of warning.

Even when using metaphors consciously, we (the teachers) have to be aware that the metaphor we use is "only one pathway and not the only pathway to understanding a concept" (p.319). Another aspect to be aware of is the fact that metaphors are culture-bound. This is of special importance for teaching in multi-cultural classrooms where metaphorical expressions vary widely according to geographical area, social milieu and specialization of interest. In Sweden where a great deal of immigration has taken place, the foreign studenst, having difficulties with the language, often express themselves by means of metaphors, which may cause difficulties for teachers who are not familiar with their culture. This works the other way round, too. Candy's (1986) presentation concerning the use of metaphors is well structured and gives a broad view of the possibilities: He argues that metaphors have a role to play: in conceptualizing and training for the field, in teaching (or facilitating learning), and in the conduct of research (p.94). He further specifies the role of metaphors in research by stating that they can be used in a) identifying research problems, b) suggesting possible research strategies, c) representing potential solutions and insights, and d) explaining results (p.98). There seems to be a great deal of interest in metaphor in the research concerning teacher education and teacher change (see e.g. Bullough 1990; McCarty et al. 1992) but so far research in the Scandinavian countries has been practically non-existant.

4.1 Examples

While gathering some examples of recent metaphors referring to education, school, and curriculum we noticed two things. First of all, there seems to be an overflow of metaphors derived from various areas such as information processing, biology, medicine, and organizational theory. Most of them seem, to be launched without any epistemological considerations, which is why their value can in many cases be questioned. Secondly, very many of the metaphors used in educational discourse are interrelated and are often based on only a limited number of root metaphors. In the beginning of our study this was a kind of intuition, which we subsequently found to hold true. We could trace back our metaphors piece by piece to some root metaphors that have generated broad conceptual frameworks and — so it seems — strongly influenced the ways educators think. They provide schemas which are, most often unconsciously, used to conceptualize and bring a sense of order and meaning to our experiences. In a way they form a level of abstract structures, which can generate further and

more complex explanations of the world.

A great number of different metaphors have been used in education over the years. Some of them remain in use for a short, limited period of time, while others have had a longer life. Also the nature of the metaphors used seems to have changed over time, a theme we want to consider in a separate paper. For the purposes of this paper we want to focus our attention first on the following three root metaphors of education: guidance, growth, and liberation, and after that take up some metaphors connected with school and activities there. Our choice of the metaphors is, to some extent, based on how frequently they have appeared in the educational literature we have reviewed. We have not, however, resorted to any frequency counts, since in our opinion, they would not greatly contribute to our presentation. The high frequency of a metaphor in a text is not necessarily an indication of its power. The same can be said of the high number of texts in which a certain metaphor appears. Thus we have not used any purely objective selection criteria, but have also resorted to our own intuition and experiences as educators.

EDUCATION

The term education is used very loosely in different contexts. It is, for instance, used to refer to a wide variety of practices without any specification. Consequently many current pronouncements made by politicians or official documents produced by school bureaucrats use the term to refer to everything that goes on in schools, without bothering to make any distinctions between the qualitatively different kinds of activity that the schools are concerned with. The various concepts, periphrases, and metaphors that have appeared have in many cases underpinned much of people's knowledge and thoughts about education.

Education as Guidance

The idea of education as guidance is historically very old. Socrates was among the most influential proponents for this view, which has often been apparent in philosophical as well as religious education. This view has also quite naturally been adopted by teachers as well as parents in the education of their children.

Originally, it is characteristic of this metaphor of education to reduce the distance between teacher, learner and subject matter. The teachers are seen here as guides, leading learners to acquire the wisdom they (the teacher) possesses mainly through imitation. For a long time this way of teaching has dominated the way parents educate their children. Children observe carefully their parents' way of coping with different, everyday situations and learn to imitate them (see e.g. Elliott 1984). Education as guidance is to be found in traditional conservative educational philosophies, i.e. perennialism and essentialism, which consider the educational process as a means for cultural transmission. Their philosophical roots are to be found in realism and idealism (Ornstein and Hunkins 1988).

This metaphor of education can be interpreted to mean several things. We must, first of all, accept the world as it is. School curricula need to be differentiated to make it possible to cultivate an intellectual elite. The studies of liberal arts are important because of their superiority. The best way to achieve this desirable goal in the learners would be to supply them with information from the rich sources of the ancient and the modern world. Education involves direction, redirection, control, and restraint, and it should therefore emphasize the use of authority. The teachers are to serve as models of truth and other virtues. They are to administer the discipline and act as experts. Values are regarded as fixed, absolute, and objective.

Education as guidance was, in fact, the prevailing view before the turn of the 20th century. As education around the middle of the 19th century began to take place in special buildings, and to be performed by specially educated people, very much of this metaphor of education as guidance was transferred to the teachers in school. Since that time this metaphor has faded somewhat and many other metaphors have come to be used to describe what teaching and learning is about. But even though the metaphors that have been used have changed over the years, the fundamental idea of education as guidance is still to be found. Especially in kindergarten and pre-school settings this view of education is very common, while in compulsory school and in higher education we are less prone today to see education only as guidance. Still, it was not long ago that educators could read the following in one of the textbooks about curriculum development: "It is not sufficient (for the teacher) to deal only with that which is 'immediate', 'crucial', or 'focal' with the individual or group. An important function of the teacher is to guide the learners in

going beyond the immediate situation - helping them to become aware of related situations...." (Stratemeyer et al. 1947/1963, 124).

Educators who view education as guidance have been greatly concerned with what should be taught and why. Thus educational discourse reflecting this view of education has also tied to determine what knowledge is most valuable. Having its root in ancient times this metaphor has been apparent in the curricula that emphasize the logical organization of subject matter and in teaching dominated by close control and supervision by adults. The subject-centered curriculum, sometimes called discipline-centered curriculum, is one of the best- known examples of this orientation. Guidance is thought to be best accomplished by organizing and planning learning experiences for children on the basis of different school subjects. This type of curriculum has been criticized during almost its entire existence. In Finland and in Sweden the criticism was at its height in the sixties and seventies around the time of the introduction of the comprehensive school system. Now at the beginning of the nineties in societies characterized by rapid changes and economic insecurity, voices are being raised for a renewal and renaissance of viewing educaction as guidance.

EDUCATION AS GROWTH

The metaphor of growth elicits the image of education as greenhouse where students are seen as plants. They will grow when nurtured with great concern for their needs by a wise and patient gardener. This metaphor rapidly acquired the status of a symbol and almost became an educational slogan. It has been regarded as a very powerful metaphor, rich in connotations. It has been (and to some extent still is) a 'standard' term, that can be employed in any form of educational discussion.

This metaphor can be traced back to the Old Testament view of children. With Rousseau (see Hytönen 1992) and Fröbel this view tended to be reinforced in their focus on 'self- realization' as the chief educational goal for children. Somewhat later this idea of education was further supported by Thorndike's child-centered psychology of education and Dewey's development of a curriculum emphasizing the life activities of children. Dewey (1916) viewed school as a miniature democratic society that transmits the culture of the society and prepares the students for a changing world. Since that time, this view of education has been very

common in educational settings in the 20th century and has become characteristic of a progressive view of education.

Education as growth can be characterized, first of all, by a belief that it is possible to remake the world. A widely differentiated curriculum, emphasizing the equal value of the liberal and practical arts, is necessary to provide for the uniqueness of each human being. The learners are encouraged to take from the accumulated human knowledge the data to be used in creating learning. Education involves experiencing freedom from imposed authority and opportunity to pursue one's interest and develop one's potential. Therefore teachers concentrate on teaching children to be active and learn how to think. The process of thinking, is emphasized rather than the content of thinking. The subject matter is interdisciplinary, rather than located within one single discipline or a group of disciplines. The emphasis is on problem solving and use of the scientific method, encouraging group-learning activities rather than competitive, individualized lesson learning. The role of teacher is unique. Both Dewey (1933) and Kilpatrick (1925) referred to this role as 'the leader of group activities' where the teacher was to help the students grow. Thus the teachers have the role of executives. Values are relative, subjective, and changeable, inhering to the circumstances in which they appear.

The child-centered curriculum is one of the best-known examples based on the metaphor of growth. In this type of curriculum the information and the skills of the different areas of the curriculum are directed towards meeting the needs, interests, and purposes of children. The child is seen as innately curious and in need of self-expression. Such a view has clear implications for both the process and the content of curriculum leading to the project-method, in which the division between subjects/disciplines is minimized or completely ignored. Learning experiences are selected primarily on the basis of their appeal to the children. In its extreme form there is 'no predetermined curriculum', while in more moderate forms there is one. Here we are using a contradiction of terms to emphasize that certain subjects such as mathematics tended to be ignored. This view has influenced education in Finland to some extent (see Hytönen 1992).

Notions of education based on the growth metaphor, although very popular, can also be criticized for suggesting that students themselves should decide upon the relevance of what is to be learned. There is the risk that too much attention is paid to what is close-at hand and immediate and that too much emphasis is paid to the individual at the expense of society.

Tom's (1984,128) criticism concerns the lack of direction of growth other than the child's internal dispositions. More extensive criticism has been presented by Elliot (1984,41-42), who emphasizes that this metaphor "is an arbitrary means of introducing favoured practices, and does not function as a scientific or quasi-scientific model". He is also concerned that this metaphor is limited in its ability to consider the criteria of mental growth and maturity that are relative to different cultures. This point seems to us most important in view of the fact that with the increase of immigration schools and classes are becoming more and more intercultural.

EDUCATION AS LIBERATION

The metaphor of education as liberation has strong political and ideological undertones. It is "the most stimulating of the educational metaphors" to Elliott (1984,50), because it has been associated with the theories of Gramsci and Freire. It can, of course, also be traced back to Habermas's critical social theory and, particularly to his emancipatory interest of knowledge (1974), which is concerned with wide sociopolitical values and goals. The emancipatory approach understands education to be a professional activity with an emphasis on the critical analysis and evaluation of the prevailing practices, and their causes as well as "liberation" from unjustified constraints and beliefs as well as repressive forms of authority. Teacher reflectivity and reflection-in-action are central ideas. The function of knowledge is to criticize, the aim is to liberate from false knowledge, and the medium for attaining it is power (see also Leino and Leino 1989). The metaphor of education as liberation has led to the development of teacher education programs (see Zeichner and Liston 1987) that aim at encouraging teachers and students to exercise their judgement about their work and help them develop schools as educational environments.

Issues related to the idea of education as liberation are often concerned with the social life created by people. This social life can be characterized by all kinds of hidden or invisible aspects, which have been analysed e.g. by Meighan (1986), who prefers the term analogy instead of metaphor. These analogies, like metaphors, present possibilities of clarification as well as problems of distortion. He includes in his analysis teachers ('victims'), pupils ('clients'), and classroom ('a haunted place'). Even though

Meighan does not speak of liberation explicitly, it seems to be included in his analysos of these hidden factors (´ghosts´) in education.

In Finland this metaphor has, at least implicitly, been guiding a school development project, in which the teachers and the administrators were encouraged to change their normative orientation to beliefs, values, knowledge, attitudes, and skills. The main goal of the project was to make school knowledge dynamic, i.e. it was to be acquired for some purpose and considered meaningful by both teachers and students. Micro-computers were introduced to the two participating schools in the very beginning of the project to awaken the interest of both teachers and students. The project involved teachers´ co-operative action at all levels, also with regard to the decision-making power delegated to them (Leino, J. 1991). Even though the author of that study was not specific about the metaphor of liberation, it is, however, obvious when one reads the research reports. We want, however, to point out that, in this case, there were no political undertones usually implicit in this metaphor. In Sweden this metaphor has had a guiding role, for instance in official documents and in departments of teacher education. However, teaching practises generally limit the possibilities of working according to this view on account of the administrative regulations and frames governing many schools.

We will not extend our discussion of the metaphor of education as liberation, because its wide sociopolitical implications would presuppose a kind of research that is clearly beyond our purposes. The question of the historical roots of liberation and, in particular, its connections with the ideas and trends prevailing at the beginning of this century have been analysed by Hytönen (1992), who sees modern critical pedagogy as a continuation of the child-centered pedagogy of the early twentieth century. He also points to the emancipatory ideas of education that are to be found in Dewey´s writings (p.27). His views are also supported by other researchers in the field (see p.143).

Considering educational contexts we think all education might claim to be guidance, growth, or liberation; however, different educational theories have different ideas about what counts as guidance, growth, and liberation. The theories also differ in their respective conceptions of the notions. No matter which of the metaphors we prefer, it is bound to be vague and open to different interpretations. No metaphor, so it seems, can give us an insight into the essence of education, because as Elliot (1984,52) has pointed out " education is not a natural species and does not

have an essence".

school

Various metaphors often at least implicitly suggest a framework for the organization of schools and classrooms. Construction metaphors are quite common in reference to the structure of an entire school system. For example when the comprehensive school system was introduced in Sweden and Finland, it was called 'grundskola' (Sw) and 'peruskoulu' (Fi). These terms refer to a foundation upon which something else, in this case further education, can be built. Historically, the metaphors of schools have often been influenced by different philosophies of education, some of which will be discussed in the following.

SCHOOL AS WORKPLACE

During the 60's and the 70's the metaphor of school as a workplace was very popular in Sweden and Finland not only in everyday speech but also governmental reports and analyses. "The inner work of school" became a particularly popular phrase in Sweden. The concept of "work" as a metaphor for what students do in school has a long tradition and is deeply rooted in our language. We speak today for instance of "schoolwork" and "homework", without stopping to reflect upon their connections or underlying meanings. By using the workplace metaphor the mental image of a place of employment was intentionally elicited. This metaphor was used by Bobbit in his book Curriculum (1918), where he advocates the factory analogy and gives lists of objectives for education. (Ornstein and Hunkins 1988,74). School functions by means of different routines, with a mechanical precision and regularity. Working time and the amount of work to be carried out are determined according to special procedures. There is a certain number of breaks to be taken at special hours of the day. When you see a classroom where "all the students proceed at the same pace through the same text under the watchful eye of the instructor, the pattern of work is similar to that of large-batch processing in industry" (Cohen et al. in Marshall 1988). The workplace metaphor has in many different ways influenced education in our countries and continues to do so. For instance it has guided a number of areas of classroom research such as classroom

management (Lundgren 1979), task assignment and evaluation (Wistedt 1987), and interpersonal interactions (Löfgren1980; Arwedson1977;1979).

For generations the workplace metaphor has socialized students to see themselves as workers and teachers as supervisors. Knowledge of firms or factories has helped educators to gain new insight into schools. Dealing with schools ('tenor') in terms of firms or factories ('vehicle') led to a redefinition of school as a system of mass production, technology, and strict control. The similarities between schools and workplaces ('ground' seem to be numerous, but there are also several differences ('tension') which concern the aims, goals and objectives of the activities in the two places, authority relationships, conditions of work, and attendance (school attendance being compulsory). Most researchers who have used the workplace metaphor have ignored these differences and let the metaphor guide their investigations in many ways, i.e. in the selection of variables, in the data collection, and in the analysis and the synthesis of the results.

Even though this metaphor, which has its roots in the progressive ideas, has so deeply influenced our way of thinking about school (see e.g. MacAnGhaill 1992), its limitations have not been seriously considered. In some countries this metaphor political implications, which may be the reason why its implicit underpinnings and limitations have not been explored. What is particularly problematic is, first of all, this metaphor's impact on many teachers, as can be seen in classrooms organized according to a single task structure, where all the students work on the same assignment at the same time. The teachers see themselves as supervisors or classroom managers, maintaining the control over the out- come and ensuring that required products are turned out at a specified rate representing a specified quality. Secondly, this social organization of instruction sets the standard for the work for others and has, together with the scientific paradigm, fostered an emphasis on procedures and work products. In school this has resulted in naive insights and a severe lack of understanding (Drakenberg 1992). Thirdly, the use of this metaphor focusses on performance and quantification instead of qualification with a resulting emphasis on the tradition that knowledge consists of procedures and discrete facts and skills taught from books or encyclopedias. This has fostered an attitude among many teachers, students, and parents that the amount of correct answers or the ability to quickly fill out the worksheet, i.e. the completion of a product, is more important than the quality of the students' work. This attitude prvails among students, who hurry to get the assignments completed in order to "get it over with" or "because

teacher told us so", rather than because the tasks are pleasurable or produce something valuable for themselves. Dickmeyer (1989,152) has also discussed the problems created by the use of this metaphor. The students can be seen as undifferentiated and dehumanized - even though the intent has been to highlight the constructive process of development in students. According to him, this possibility makes the metaphor, sound like an alarm to many teachers. To sum it up, the use of this metaphor emphasizes the behavioristic view of learning and teaching, which indicates that the purpose of learning and that which is personally meaningful in learning has been lost - or overlooked. In other words "conceptualizing the classroom as a workplace neglects those unique qualities of the classroom that create a 'learning setting' " (Marshall 1988, 9).

SCHOOL AS ORGANIZATION

This metaphorical description of school as an organization having the same form as the one presented, e.g. X as Y, was developed during the 80's. By using concepts and arguments from theory of organization, especially of organizations seen as systems, educational researchers tried to create a new perspective on school. A theoretical frame of reference was developed that was intended to facilitate the description and the understanding of the changes in school and teaching.

Organization theory during this century has been dominated by three main approaches. The most recent of these, the system theoretical approach has become a predominant view in the 80's. Attempting to understand the increasing complexity of school, the writers of a number of textbooks, articles, and papers have regarded "school as an organization". Hereby school has either been characterized as 1) a functionalistic system, i.e. school is composed of different parts, which together constitute a social totality, or 2) a structuralistic system, i.e. school is considered to be an institution depending on and limited by the economical, social and political structure of the society (Berg & Wallin 1982).

The structural perspective has lately been very popular, and a number of researchers in Scandinavia have followed this line (e.g. Dahllöf 1967, Lundgren 1979, Berg 1981). Considering whether schools should be regarded as systems, a popular view within the business world, or from a more rationalistic perspective, most of the politically left-oriented educational researchers have favored the rationalistic view. Yet, both perspectives emphasize of it. By considering school to be a hierarchical or-

ganization, distinguished by its structural conflicts, Berg and Wallin (1982,98) favor the rationalistic perspective. This perspective could, for instance, be characterized as follows: it is founded on a mechanistic world view, actions taken by the organization are decided on the basis of goals-means analyses, and the actors in the organization are themselves to decide how to reach the goals with the means given.

This rationalistic view is, however, impaired by the following disadvantages: the circumstances in the surroundings of the organization are seldom taken into consideration, insensitivity to disturbances (disorders) due to intrinsic contradictions in the organization is wide-spread, and finally the inherent limitations of the methodological goal-means analyses have not been overcome. The use of the rationalistic perspective of organization as a metaphor for school in order to be able to better describe and understand changes in school and teaching, is as we see it confronted with great difficulties. Researchers committed to this view of school do not, however, seem to have considered the problems related to this metaphor of school - or have they just overlooked them? Is the use of this metaphor a case of misunderstanding? Is it an effect of considering only some limited aspects of it ? Is it an ideologically hidden attempt to mislead? It seems to us that the metaphor raises many more questions than it answers. It does not illuminate or clarify, which is why the metaphor of school as a rationalistic organization seems to have missed the mark.

Because of their ambiguity, it seems that these metaphors of school, though extensively used in educational discourse, are incomplete. They are flexible instruments for communication, but they lack depth.

Curriculum

The first point we want to make is that curriculum itself is a metaphor originally referring to 'a course to be run' (Lawton 1984) but the metaphoric meaning has long been forgotten, and the concept is accepted as one of the most central in education. The Finnish and Swedish equivalents ('opetussuunnitelma' and 'läroplan') of the term do not, however, have this kind of metaphoric origin, but would rather translate into English as 'teaching plan'. Curriculum can be considered an instrument of society for the education of the young. It reflects the ideas, the knowledge, and skills

that are believed to be significant or that are related to the daily activities of the members of the society. It is thus interwoven in the social and political structure that sustains it. Curriculum is often defined as "all the planned experiences provided by the school to assist pupils in attaining the designed learning outcomes to the best of their abilities" (Neagley and Evans 1967,2). This definition seems to have been quite widely accepted, but otherwise there is very little agreement in the field. Kliebard (1982,11) has pointed out that "one of the surest ways to kill a conversation on the subject of curriculum theory is to ask someone to name one". Curriculum can also be understood as a political test (see e.g. Pinar and Bowers 1992) and this is the way it was understood in the Scandinavian countries at the time of the great educational reforms, the major of which was the introduction of the comprehensive school system. The social, historical, psychological, and philosophical foundations are the ones that are commonly accepted for curriculum. These offer what could be thought of as the external boundaries of curriculum, while the different subject matter areas define the internal boundaries. It has been typical of curriculum development in the Scandinavian countries that a consensus must ultimately be achieved between those representing different ideologies and interests, and that the consensus is that which is achieved by the majority of those participating in the process. The final decision concerning what kind of curriculum the schools are to follow is made by the politicians. Since the so-called curriculum specialists can agree only on the external boundaries, but not on the internal boundaries there is a great deal of built-in disagreement, which is reflected in the many types of curriculum metaphors existing.

Balanced curriculum

School curricula are often said to be out of balance, and whenever demands are made for a new emphasis in the curriculum, a plea is made for balance. If a learner were to participate in the teaching which follows a balanced curriculum, it would mean that there would be a perfect match between his or her particular characteristics and the instruction provided at a given time. The balance dilemma has been thoroughly discussed for instance by Eisner (1975) and Kelly (1986). They stress that for decades there has been a strong desire to find a balanced curriculum. However, the term balance is not very precise and over the years different interpretations as well as different strategies for providing a balanced curriculum have been available.

The idea of a balanced curriculum can be traced back to Plato, whose key concept was that of "harmony" (Kelly 1986,135). Since then balance has been a key notion in education of most Western countries, and during the past few years many variations on this theme have emerged, e.g. depth versus breath, common versus specified, static versus dynamic, program logic versus learner strategy, theoretical versus practical, cognitive versus affective etc. Just the possibility of having so many interpretations indicates how blurred the concept of "balance" is. Used in the context of natural sciences, balance invlves an exact and precise measurement, a connotation many researchers and politicians try to transfer to educational contexts, where it is figurative. It is a metaphor, and, as most metaphors, only partly valid, we consider it important to identify the limitations of its application.

There seem to be two main kinds of balance which the curriculum worker needs to be concerned with. One is balancing the subject matter against the needs and demands of the individual learner, and society and the other is a reasonable and flexible balance between various subject matter areas. True balance is difficult to attain. For one thing, what constitutes a somewhat acceptable balance today may be seen as imbalance tomorrow. Another problem is that a balanced curriculum for the individual cannot be achieved simply by attempting to teach everybody the same things. Differences in maturation and learning, for instance, make it difficult to provide balance for the individual. A school program that is truly balanced for the individual pupil can be created only in a system of flexible scheduling with a curriculum which contains varied experiences from which the pupil is reasonably free to select. Critics, however, question whether the pupils who are "uninitiated into the many realms of disciplined experience, (can) be expected to arbitrate their own learning experiences" (Whitfield 1971, 10). So far, the problems of scope, sequence, and continuity in balanced curriculum still remain largely unsolved. Doll (1986, 160) concludes that "perhaps the best that can be done in working towards balance is to be aware of what is valued for the growth of individual learners and then somehow to try to apply these values in selecting curriculum content, grouping pupils for instruction, providing for articulation, and further guidance programs". Another solution to the problem of "balance" is suggested by Kelly (1986, 149), who stresses that balance is not to be found in a balance of subject-contents but in a balance of experiences for the pupils. He argues that as long as " the methods by which they (the students) are encouraged to learn are the same - listening to teacher, an-

swering his/her questions, reading a text book, copying notes from the board, writing brief essays and so on- " ...."the true balance agent lies not in the subject content but in methods and approaches of the teacher and his interaction with the pupils". The phenomena of "balance" has, as earlier mentioned, been discussed by researchers and others interested in curriculum development and this discussion is likely to continue, probably because this metaphor, like so many others, means different things to different people.

Core curriculum

Based on the work of Dewey, different "core programs", began to appear on the educational scene in the fifties and sixties. Curriculum as "core" includes the idea of supplying life and nuturants to the organism. The term referred to both an administrative arrangement and a program for educating boys and girls. This approach was later on to be characterized as a "half-developed design" (Firth and Kimpston 1973, 317). One of the aims of core curricla was the integration of the students' and society's needs; thus common course contents were to be arranged around common problems and the interests of the students. Common problems were oftenmet by what was referred to as general education. Core curriculum programs are only restricted by the boundaries of the subjects assigned to the cores, which gives the students greater possibilities to discover relationships within the combined subject areas. Another characteristic is flexibility in the use of time. These studies, depending on their nature, may last for weeks and sometimes through the entire semester. The allotment of time to the core program (and to the pursuit of special concern) depends upon the learners' maturity, their needs and readiness for work. Other characteristics include also a freer and more flexible instructional procedure and a greater variety of learning experiences. The emphasis is supposed to be on problem-solving methods and critical thinking. Reality shows, however, this was not alvays the case.

The lack of proper teacher preparation as well as adequate instructional materials is often mentioned among the drawbacks connected with this curriculum. The vagueness of this particular metaphor has been emphasized by Kelly (1986), who points out that the many different interpretations of "core" make possible to use that term of almost any curriculum. As to the use of this metaphor in the educational context of Sweden and Finland, the English term has been used in Sweden at the university level

to refer, for instance, to certain programs in social sciences. Otherwise the concept as such has not been in frequent use. Occasionally the Finnish translation of the metaphor has appeared in the discussions of the "basics" of some individual school subject. On the other hand, the general ideas connected with this metaphor have influnced the development of the curricula in our two countries.

Hidden curriculum

'The hidden curriculum' is a term used to refer to the implicit, unstudied or unintentional aspects of teaching and learning, those that lie outside the boundaries the school's intentional efforts. In examining the specific nature of the hidden curriculum it is useful to distinguish between the constants and the variables (Glatthorn 1987,20). The former consist of those aspects of schooling that seem more or less resistant to change. One of them is the ideology of the larger society, another is the way in which educators construe legitimate knowledge and define its operative concepts. A third comes into play in the classroom where issues of control often become dominant through the differential use of power. The variables are those aspects that seem susceptible to reform and these consist of organizational, social system, and cultural variables (Glatthorn 1987, 21-24).

The metaphor of hidden curriculum, as it is understood in Finland, is attributed to Jackson (1968), who wrote as follows: "As implied in the title of this chapter (The Daily Grind), the crowds, the praise, and the power that combine to give a distinctive flavor to classroom life collectively form a hidden curriculum which each student (and teacher) must master if he is to make his way satisfactorily through the school. The demands created by these features of classroom life may be contrasted with academic demands - the "official" curriculum so to speak - to which educators traditionally have paid the most attention. As might be expected, the two curriculums are related to each other in several ways" (33-34). The metaphor has been more or less explicit in the discussions concerning the curriculum, teaching, learning, and also to some extent in research in Finland and Sweden. The official, explicit curriculum here typically refers to the written, official document, which is followed in all the schools of the country. There are, however, many aspects of hidden curriculum which are not made explicit in writing, but which, nevertheless, affect the nature and the direction of the teaching/learning

process. Space and time allocation are for example such facets of hidden curriculum which are not very often considered. Instead, in most cases hidden curriculum has come to be closely connected with the meanings, beliefs, and "truths" that the students acquire at school. The fact that teachers give more attention to boys and ask them different kinds of questions than girls is often cited as an example (there is also some research evidence to support this). Experiments are currently going on in certain schools in Finland with the purpose of making it possible for each school to have its own curriculum instead of the centrally controlled national curriculum, and these (centrally controlled) experiments have introduced the latest metaphor which is "aquarium" schools. The metaphor refers to the participating schools and naturally to some kind of openness in the approach but the term itself may create negative attitudes among the teachers. (The visual image that this metaphor elicited in one of the writers when she first heard it a couple of months ago was that of a bubbling fish-tank, with outsiders curiously staring at what is going on inside.)

Null-Curriculum

A traditional view of curriculum is that teachers transform curricular intentions into a set of activities in order to make the intended skills and knowledge accessible to their students. However, school and curriculum change rather slowly, while the world around us changes very rapidly. A society is constantly facing areas of new needs, of which learners should become aware. Schools should take more responsibility in areas where home and community cannot provide enough help. In the United States, in order to keep up with the rapid changes, a new metaphor for curriculum has been introduced in the term "null" curriculum coined by Eisner (1979). This null curriculum constitutes what students do not have an opportunity to learn under the auspices of schools. The null curriculum is virtually infinite, and it changes of changes in the national curriculum and new discoveries. For instance, until quite recently computer education fell in this null curriculum. Societal changes have also brought attention to the problems of teenage pregnancy, AIDS, and high unemployment. These are all teaching topics that are or have been included in the null curriculum. The content of this null-curriculum resembles the Contemporary Issues Curricula, described by Leming (1992), who states that these kinds of curricula have had a very low impact - sometimes even opposite effects — on the students. The idea behind these two kinds of curricula seems to be

the same but a different label is used. In Scandinavia the concept of null curriculum has not yet become known, but it is appropriate for us to familiarize our readers with what might well be an additional curricular agenda parallel to the national curriculum.

4.2 Summary

The examples given above are not in any way representative. Ultimately we finally selected them because of their frequency and their seemingly dominant position in educational contexts. These metaphors have, in fact, become so common in educational discourse that those working in education may not even realize they are using metaphors which influence the way people (e.g. colleagues, students and others) think and act. During our research we gradually realized that all the metaphors discussed in this paper are related to each other in many ways. As we see it, there are no clear boundaries between the metaphors and it would be impossible to claim that balanced curriculum, for instance, is only to be regarded is an expression of education as growth. Metaphors are pregnant with different interpretations and connotations and, depending on the interpretation selected, balanced curriculum can equally well be interpreted as an expression of education as growth or liberation. Of course the same is true of the other metaphors discussed here. It seems to us that a historical l analysis would be necessary before anything more spcific could be said about the interpretations of three metaphors.

4.3 Understanding metaphor.

Questions concerning the comprehension of the phenomina of metaphor have attracted a great deal of interest among researchers. Cognitive scientists, in particular have dealt with these questions extensively. When speaking of understanding, a distinction should be made between understanding something that is read and understanding something heard. When reading one can proceed at one's own speed and reread if necessary, while listeners are "at the mercy of" the speaker's speed, and dependent on their own attention and memory. The immediate situational context is decisive in listening, while it has very little, if any, importance for reading. The knowledge, beliefs, and suppositions shared by the speaker/writer and hearer/listener are, of course, important in both contexts. When speaking

of comprehension of metaphors in the following we will, if not otherwise indicated, be dealing with written language.

When we consider the question of understanding metaphors in the light of the theories presented in chapter two, the first point to be made is that most deal with metaphor as a purely linguistic and philosophical phenomenon. Therefore it is not surprising that they do not have much to say about comprehension. If any comment on understanding, it is almost to be regarded as a by-product of their main interest. In the following we will deal with the question of comprehension in terms of earlier theories and after that mention some of the latest developments in the field.

Substitution theories see feature comparison as insufficient for explaining comprehension, particularly in cases with unfamiliar tenors. Therefore a transfer process is suggested. The terms involved in implicit comparison must first be identified, then the implicit comparison is transformed to an explicit comparison. Finally this comparison must be interpreted by the special comparison process. Due to the difficulties involved in understanding metaphor, representatives of the substitution view expect metaphor to be interpreted more slowly than literal sentences. Some empirical support has been given by Ortony et al.(1978a). This is not, however, accepted by Glucksberg et al. (1982, 97) who emphasize that "whether an expression is intended literally or not may have little or no effect upon the ease with which that expression is understood or upon the selection of the comprehension strategies that may be used to accomplish that understanding" .

The tension theorists argue that the transformational rules, suggested by substitution theorists, cannot be applied to metaphor, because such an applicatiom involves a violation of a selection restriction. Chomsky (1964) emphasized that this violation can be avoided by finding a higher-level category to which problematic items belong, and it is at this more abstract level that the violation will disappear. This means that the restrictions are loosened by dropping some of the features of tenor and vehicle. The features are transformed to a higher abstract level and in doing so the tension is reduced. Another solution presented by Katz (1964) suggests that adding new rules to grammar would relax the rules of ordinary grammar so that they will be applicable to metaphorical sentences. According to the tension views, understanding metaphors is, difficult and has to be accomplished in two steps. When our first attempts to use a literal meaning fail on account of the tension, we either evoke

special rules or ignore the violated rules. The tension theorists seem, however, to fall back on the processes of feature comparison when explaining how metaphors are understood. It is not therefore surprising that they interpret metaphors in two steps and predict that they take a longer time to interpret than literal expressions. As can be seen, the similarities with the substitution theories are quite obvious, which is one of the reasons why we included them in substitution theories in chapter two.

Interaction theory, which stresses similarity and dissimilarity equally, does not make very concrete proposals about the processes involved in the interpretation of metaphors. Black (1962) has suggested that interpretation involves not so much the comparison of tenor and vehicle but rather construing them in a radically new way so as to create similarity between them. "Their (interaction metaphors) mode of operation requires the reader to use a system of implications as a means for selecting, emphasizing and organizing relations in a different field. The use of a 'subsidiary subject' to foster insight into a 'principal subject' is a distinctive intellectual operation, demanding simultaneous awareness of both subjects but not reducible to any comparison between the two" (Black 1962,46). To interpret metaphors we have to see tenor and vehicle in a new way, but the theorists do not specify how this is done.

The domains-interaction theory, which can be characterized as a psychological or cognitivist rather than a linguistic or philosophical theory, is very specific about the process of understanding a metaphorical expression. One has to identify the tenor and vehicle as well as the domains from which they are drawn. This is done through the following hypothesized steps: 1. encoding, 2. inference, 3. mapping, 4. application, 5. comparison, 6. justification, and 7. response. (Tourangeau and Sternberg 1982). The resemblance of this model to that presented by Kintsch (1974) or implied by Verbrugge and McCarrell (1977) is obvious. The model could be regarded as a potential account of how this interpretation stage might be achieved. One implication of this view might be that comprehending the nonliteral meanings of utterances requires more time and effort than comprehending literal meanings. The domains-interaction view, however, makes no clear prediction as to whether metaphor is understood more slowly than literal expression (Tourangeau and Sternberg 1982).

Of the approaches delineated above, the one developed by Tourangeau and Sternberg represents the most modern one. There is also some empirical evidence to support it. There are, of course, other approaches or models

such as e.g. Gentner's structure-mapping model (Gentner and Clement 1989) and Ortony's salience imbalance model (Ortony 1979). The theme seems to be quite popular in psycholinguistics and artificial intelligence, which are fairly new fields of study, but certain philosophers have also dealt with this problem (e.g. Davidson 1978; Searle 1979/88; Gibbs 1987; Way 1991). So far, however, the question of comprehension is still very much an open one.

Recently, interesting discussions have published in Psychological Review (1990 Vol 97; 1992 Vol 99). Glucksberg and Keysar (1990) as well as Gibbs (1992) have presented an outline that may well prove to be a criticial break-through in understanding metaphor. They have proposed a class-inclusion model of metaphor comprehension, meaning that we do not understand metaphor as implicit simile. "Most generally, the classinclusion view suggests that when metaphors are expressed as comparisons, they are interpreted as implicit category statements rather than as implicit similes that require recognition of some underlying similarity to be understood. The groupings that are created by metaphors induce similarity relations, and so the groupings are prior to the recognition of similarity (Gibbs 1992,572). If verbal metaphors reflect ad hoc categorization, Gibbs argues, then each expression should reflect different metaphorical mappings between different source and target domains. (p. 573).

Although the Glucksberg and Keysar model is interesting and significant because it emphasizes the relationships between metaphors and categorization processes, it has also been seriously called into question by Gibbs, who calls attention to the limitations of the model. He argues that most metaphorical expressions instantiate underlying and preexisting metaphorical categorization schemes by using conceptual knowledge from a target domain to be understood in terms of a dissimilar source domain. According to the class-inclusion model permanently established, conceptual strutures are used to create ad hoc categories from which verbal metaphors arise. Research, however in cognitive linguistics, philosophy, and psychology suggests that metaphors do not arise out of temporary ad hoc processes. Instead metaphor is a fundamental characteristic of how people conceptualize and make sense of their experiences, learning, and thinking. What Glucksberg and Keysar seem to have overlooked is the possibility that conceptual structures in the long-term memory can themselves be organized by metaphors.

Gibbs in his research stresses the role conceptual metaphors play in our understanding of verbal metaphors and he emphasized the possibility that people make sense of many figurative expressions because of the metaphorical knowledge in their long-term memory. This does not, however, necessarily indicate that people automatically instantiate preexisting metaphorical schemes in long-term memory during on-line processing of verbal metaphors. This is why more research is needed to establish under what conditions and to what degree conceptual metaphors are activated. In conclusion, the class-inclusion model (Glucksberg and Keysar 1990) and the conceptual metaphor view (Gibbs 1992) provide a coherent account of metaphor comprehension in conventional language use as well as in the comprehension of metaphorical expressions.

As far as education is concerned it has hardly touched the problem and research on metaphoric comprehension (particularly in adults) is sparse. Interesting research is, however, being carried out particularly in Canada by Jean-Paul Dionne and his research group (personal communication, August 1992).

5 Discussion

Our interest in metaphor was awakened through studies of learning styles, and since hardly any research on metaphor in education has been carried out in Scandinavia, we decided to study the concept. Our overall aim was to familiarize ourselves with the concept and its theoretical background, find out an acceptable definition for it, and finally, to study it in educational contexts. For that purpose we carried out a study of literature in the field. Since metaphor is anything but an unknown concept in many other fields than education we reviewed literature from such fields as philosophy, literary criticism, language theory, theology, psychology, artificial intelligence, and cognitive science. It is, in fact, rather difficult to exactly specify the fields we were drawing from since the differences between the various disciplines are rather vague and such specifications may not even be meaningful. Metaphor as such, is a very interdisciplinary concept.

Information retrieval of relevant literature was carried out from Eric and the national databases. The former yielded numerous titles, and the latter hardly anything. This search was complemented by manual search in university libraries in Finland and Sweden. Although it was our policy always to use primary sources, we were handicapped in some instances by the extensive traditions behind the study of metaphor in certain fields. We, however, realized the importance of this policy after noticing several times that the references and citations found in part of the literature were not always adequate.

The two co-authors have participated actively in the development and realization of this study in all its aspects. All the literature has been read by each of us and its strengths and weaknesses have been intensively discussed and penetrated, a circumstance we consider to exclude too much subjectivity. The writing of this paper has also been a cooperative effort: each section has been carefully analysed and discussed. Through many revisions the first rough draft has gradually been worked out into its present form, which we consider to be adequate for our purposes.

The final choice of literature was made with the view of defining the concept in mind. For this purpose we had first of all to study different

theories of metaphor, which, however, did not directly lead to an acceptable definition but to a study of different definitions, some of which were not related to any of the background theories at all. Also a study of a number of related concepts had to be carried out, since the whole field seems almost to be in a conceptual chaos. The definition we finally accepted, at least as a working definition, is both wide and specific.

In chapter four we gave some examples of metaphors in education. Before writing this chapter we had to decide whether to use a deductive or an inductive approach. Considering the fact that metaphors do not exist in a vacuum, but are deeply embedded in their social, cultural, historical, and political background, the deductive ("top-down") approach would have been defensible. However, we favored the inductive ("bottom-up") approach, presenting the examples first and only after that relating them to a more general background. This is partly due to the fact that at the time we were carrying out that part of our research, we did not yet know what kind of metaphors were to be found and whether it would be posible to relate our findings to broader background issues. It seems now that the deductive approach might be better suited for our subsequent study. Our choice of the examples is based on the reasons previously given. We make no claims whatsoever concerning the representativeness of our examples. At this stage we were mainly interested in seeing what is to be found in the field. At the time we started, we did not fully anticipate the complexities and the overflow of international literature we were to encounter.

In order not to go beyond the scope of what was originally intended to be a small-scale study of the theme from an educational viewpoint, we had to leave out some interesting topics, such as the various learning metaphors. The metaphor of ´surface´ and ´deep´ learning are, for instance, very popular in Scandinavia. However, the origins of this particular metaphor go deeper than educators here generally seem to realize. Another interesting theme would have been the role of metaphors in guiding educational research, in the way ´language game´, for instance, has done even in the Scandinavian countries, particularly Finland. This could be done through a study of the doctoral dissertations presented in our countries. Such a study would give an idea of the leading metaphor(s), if any, prevailing in the younger research community. A third theme, which is perhaps the most important bearing in mind that education is a practical field of study, is the role of metaphors in guiding action, and in teacher development.

What has been quite problematic in our study of metaphor is the well-known fact that it is so closely intervowen in the particular culture and language of a certain community. Some metaphors seem to be international or intercultural - particularly in the so-called western cultures - representing word for word translations equally well understood in any of these cultures. But there are also cases in which the linguistic problems seem almost insurmountable. The growth metaphor, which we discussed earlier, is a good example. It is particularly deeply embedded in the educational language in Finland, which may even be attenuated by the fact that the same Finnish word 'kasvatus' corresponds to both 'growth' and 'education' in English.

What we consider to be an interesting result of our study is the existence of three root metaphors (there might be more) reflecting three different views of education: education as guidance, education as growth, and education as liberation. These metaphors give quite different perspectives on education, especially in respect to their implications. They have, in one way or another, dominated the educational debate and also directed and determined the focus of much research. Consequently, their impact is to be seen both in the kind of research conducted by theorists and the way they have been interpreted by politicians and teachers. These three views of education prevailed at varying times in the history of education. No clear-cut time limits are, however, possible, and, as far as we have seen, all three views of education have had their proponents and they have, in a way, been co-existing, although one view may have been more dominant than another. This dominance is clearly seen in the metaphors used in educational texts, as will be discussed in a later paper.

We also found school as workplace and school as organization to be among the dominant recent metaphors. According to our view, which is based both on the literature we have read and our general knowledge of the educational systems in Finland and Sweden, the two metaphors include hidden political implications, often to be found in the field of education nowadays. These metaphors are also examples that can be traced back to the rationalist view or guidance view of education characteristic of many left-wing politicians, researchers and teachers. The reasons for this are quite obvious according to Kelly (1986, xvii), who emphasizes that it is a characteristic of the rationalist view to consider its own value positions indesputable and non-problematic, and to fail to recognize what the prescriptions actually represent - an educational dogmatism "emphasizing a

curriculum consisting of 'intrinsically worthwhile' bodies of knowledge".

The school metaphors in particular raised the question of why and how metaphors are used. What are the intentions behind the use of certain metaphor? What connotations does the metaphor have? What aspects are highlighted and what ignored? Some metaphors become successful in the sense that they are widely used, so widely, in fact, that they become officially accepted and part of everyday (educational) language, as is the case with the metaphors discussed in this paper. In order for educational policy-makers to create widely accepted metaphors, they would have to co-ordinate what they consider to be their assumptions, associated meanings and beliefs, and the images which they elicit. The conclusion we draw on the basis of our study is that metaphors with a pronounced political intent have often been used in pedagogical contexts with the aim of focusing thoughts and actions in a politically desired direction. This is, however, only one of the functions that a metaphor can have. In the following we will briefly discuss two other overall functions of metaphors.

The first is their theory-constitutive function. The learning theories which are, for instance, concerned with mental mechanisms or operations below the level of consciousness are describable only by metaphorical means. Metaphors are used in the pretheoretical stages of a discipline to introduce new terminology and concepts where none existed before, to invite a search for analogies, and to organize reflections and explanations. They can open up fresh possibilities of thought and action — and equally well limit such possibilities.

The second function of metaphors is pedagogical: they are used as a teaching/ learning device. In this context the question of the comparison or interaction view of metaphor is relevant. In the classroom metaphors are used intentionally to illuminate and enhance learning. They have been found to be particularly useful when something new is introduced to the students. They provide a bridge from the known to the unknown. All this often happens by means of comparisons. To what extent metaphors fill the same function as 'advance organizers' (Ausubel and Robinson 1969) in making learning meaningful would be a relevant question for research. Metaphors can also be used interactively and many researchers (e.g. Petrie 1979/1988) mention the use of metaphors as clarifying devices between what is familiar and completely unknown to the students. Petrie (p.445)

explains this as follows: "an interactive metaphor creates an anomaly for a student and leads the student toward changes in cognitive sturcture". In describing how this works in practice Petrie somehow seems to lean back on the comparison view of metaphor, because he, by means of gradual, stepwise comparisons, approaches the completely unknown (see p. 453-454). Petrie´s description of how an interactive metaphor works in practice is somewhat confusing because, as far as we can see, the completely unknown seems to be conceptualized on the basis of the student´s old conceptual frame of reference. The interactive use of metaphors is only a way of extending the student´s ways of thinking and, contrary to the claims made in part of the literature we read, does not necessarily indicate really new ways of thinking. The final point we want to make of metaphor as a teaching device concerns the teacher´s choice of metaphors and how students actually understand them. Understanding metaphors is mainly considered to be a stepwise procedure, sometimes occurring so rapidly that the steps blend into one single mental act, the context of which has often been overlooked in research. We consider the context to be importat, since metaphors do not exist in isolation but are linguistic expressions used in a particular way.

We are going to continue our study on the basis of the ideas outlined above. During this process we have become convinced of the importance of sensitizing those working in education to the power and possible implications of metaphor.

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ISBN 951-45-6[illegible]7-8
ISSN 0359-574[illegible]
Helsinki 1993
Yliopistopaino